The Magazine of

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MARGINAL NOTES

International Cooperation—

International cooperation is in the news today, not only in politics and atomic energy but also in standardization. As reported in this issue (page 229), American industry, represented in a number of ASA sectional committees, exchanged ideas this spring with representatives of British and Canadian industry. Their purpose was greater unification of screw threads, methods of gaging, fits between machine parts, and similar problems that make interchange of equipment difficult. Anyone interested in the very sketchy report of the ABC conferences contained in this issue and wanting more details can obtain the complete report when it is published by The American Society of Mechanical Engineers. The ASA staff has been helping to check the manuscript. It has taken a hand in circulating the voluminous correspondence among those who took part in the conference as one step in assuring complete accuracy of the published report. As this issue of THE MAGAZINE OF STANDARDS goes to press, the final manuscript is now in the hands of ASME, cleared for publication.

The International Organization for Standardization and the International Electrotechnical Commission operate on a broader program of international cooperation than do the ABC conferences. Goal of ISO and IEC is unification of standards in all industrial standards-using countries.

This year all 35 member countries of ISO were represented at the ISO General Assembly and ISO Council meetings at Stockholm, Sweden, in June and July. As this issue goes to press, USA delegates to ISO meetings are returning to this country, vocally enthusiastic over the friendly atmosphere and tangible results achieved at these meetings. A general story of the ISO and its older electrical division, the International Electrotechnical Commission, will be published in the September issue of THE MAGA-

ZINE OF STANDARDS. As delegates to ISO technical committees report, their stories will be published individually.

Better Service for Homemakers—

In the past few years, sales of freezers for freezing and storing of frozen foods have brought approximately 1,000,000 additional units annually into use in this country's homes. As explained by M. C. Turpin in his article on page 234, standard tests for checking the performance of these home and farm freezers have been badly needed. Now, industry has such standard tests, agreed upon for nationwide use. The results will be passed along to homemakers in more reliable freezer performance as manufacturers check their products in accordance with the American Standard tests.

The New Acoustics Standards Board—

The extensive work on standards in the acoustical field has been recognized by ASA by creation of a new administrative board to supervise the work of the technical committees (page 253). The Acoustical Standards Board is the twelfth to be organized by ASA's Standards Council to take the responsibility for standards work in specific fields. The others are Electrical, Construction, Consumer Goods, Graphic, Highway Traffic, Materials and Testing, Mechanical, Mining, Miscellaneous, Photographic, Safety, and the Chemical Industry Advisory Board.

The Front Cover

Work on a Proposed American Standard on Decimal-Dimensioning Scales has progressed satisfactorily under the American Standards Association's General Conference Method. When finally approved, it is expected the standard will make it easier to obtain decimal scales for use in drafting rooms and in the shops.

Decimal Dimensioning was the subject of a paper presented at the Company Member Conference earlier this year (page 239). It also figures in the work of the committee on Drawing and Drafting Practice. As announced previously (THE MAG OF STDS, July, 1955, page 221), a tentative draft of a proposed standard on Dimensioning and Notes is now being circulated for comment. This has been prepared as Section 5 of the Proposed American Standard Drafting Manual now under development.

This Month's Standards Personality

Arthur S. Johnson is one man who has disproved the ancient saying, "A prophet is not without honor save in his own country." Mr Johnson was honored recently by his native State of Massachusetts "in recognition of his exemplary leadership in the promotion of safety and life conservation during 1954." On this occasion he received the Annual Special Award of the Governor's Highway Safety Committee of Massachusetts.

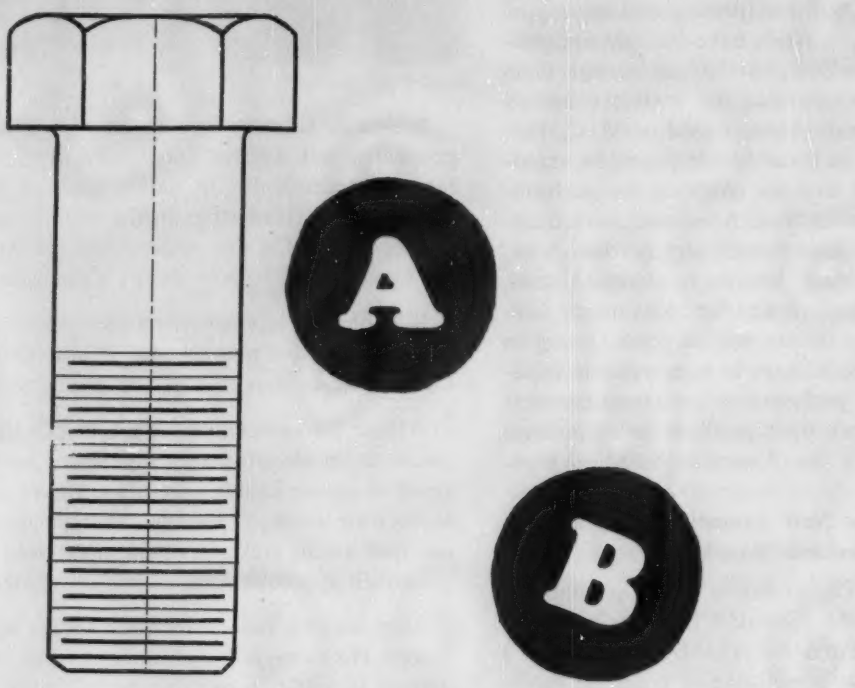
Mr Johnson is engineering vice-president of the American Mutual Liability Insurance Company. He is also serving his first year as chairman of the American Standards Association's Standards Council.

Arthur Johnson chose his career of safety engineering when early in his career as an electro-chemical engineer he saw men killed and maimed as a result of unsafe facilities, unsafe practices, and complete disregard of danger. In his own words, "I became determined to find the proper tools and methods that would make industrial operations safe and proceeded forthwith to get myself appointed to the safety committee of the concern where I worked."

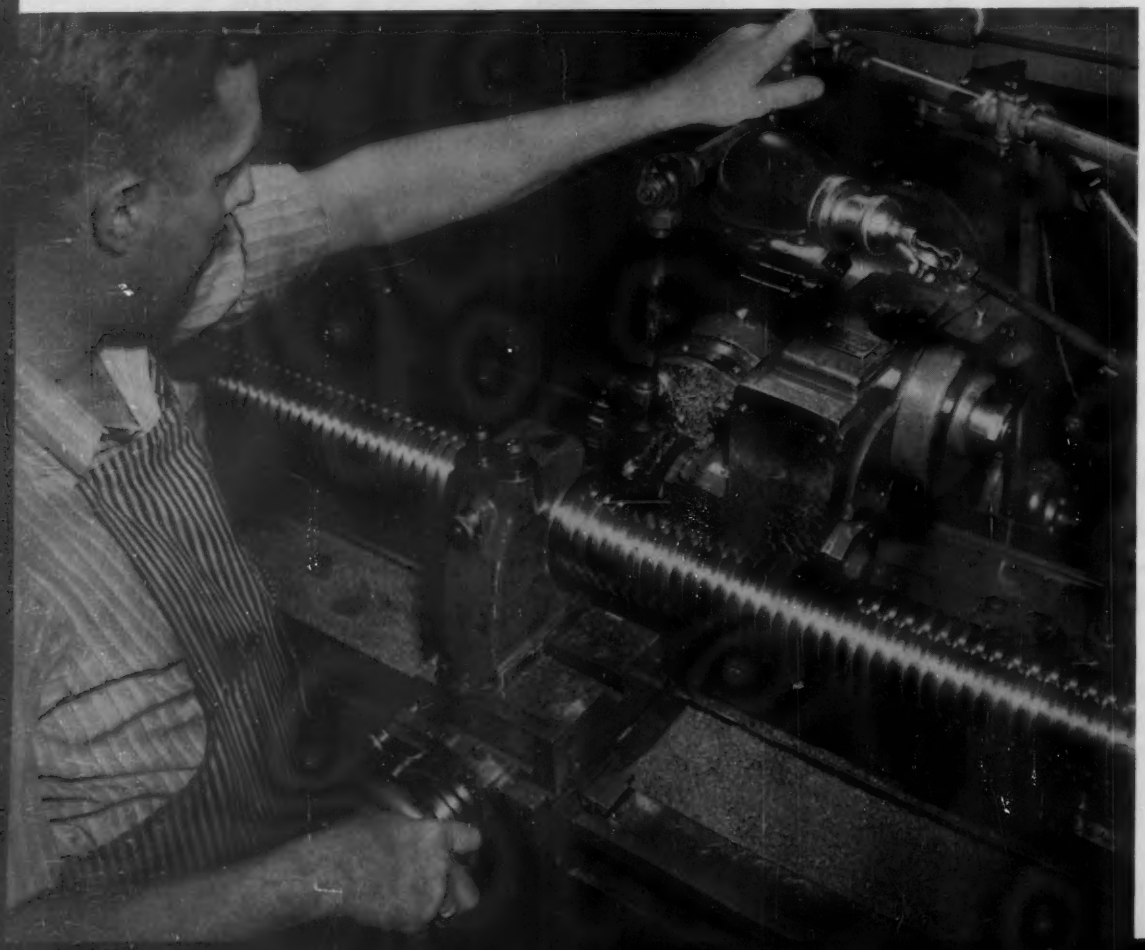
How well he has devoted himself to his chosen career is evident in his record. His name is known and respected wherever the nation's safety people gather. In addition to directing the work of American Mutual's hundreds of safety engineers and technical people throughout the country, he has specialized in three prominent areas of activity. First he has worked for progressive safety methods and procedures that support the consultation activities of his company's engineering staff. Second, he has contributed to the non-industrial aspects of safety by working with the Institute for Safer Living and assuming leadership in numerous public safety and health organizations throughout the country. Third, he is always ready to assist in problems of management that have a bearing upon standardization. He is currently serving on the Executive Committee, Industrial Conference of the National Safety Council; Traffic and Transporation Conference, National Safety Council; Engineering Committee of the National Association of Mutual Casualty Companies; and is a member of the Health and Safety Committee of the National Association of Manufacturers. His many contributions to the safety technical press would fill several volumes.

Again in his own words: "Each succeeding year that I have worked in the safety engineering business has convinced me that if the American way of life is to survive, and by this I mean well being through free enterprise, it must demonstrate increasingly the spiritual qualities of charity, compassion, and tolerance, which are founded upon the equal dignity of all people. The practicalities of the situation are never attained until each person can pursue his own destiny without injury resulting from someone's failure to think or act."

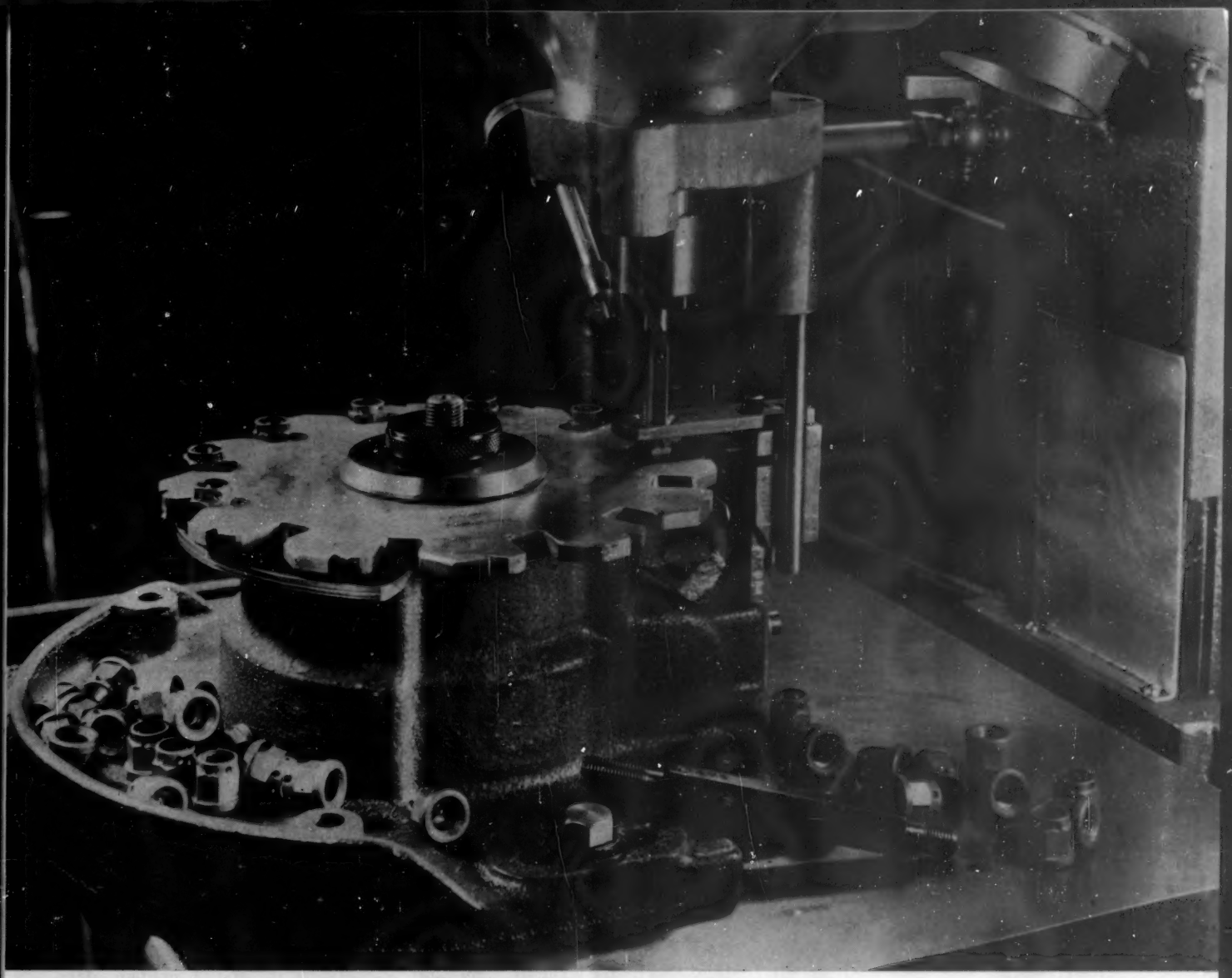
Understanding Fostered in



Pratt and Whitney



Double Acme screw thread *being milled (left). Acme threads are included in ABC Unification agreements. Gaging problems given serious consideration at ABC conferences included new concept on gage sizes offered by USA delegation, and allowances for "Go" and "No Go" gages (above right).*



CONFERENCE

"ABC" in the title of the "ABC Conference" held in New York April 11-15 might have stood for "American - British Commonwealth Conference" rather than, as it did, for "American - British - Canadian Conference." In addition to large and representative delegations from the United Kingdom, Canada, and the USA, observer delegations were present from New Zealand, Australia, Pakistan, India, and South Africa.

Most important achievements of the conference were development of mutual understanding rather than specific agreements, the delegates agreed.

The Conference was called by the American Standards Association at the request of the Office of Defense Mobilization and sponsored by the American Society of Mechanical Engineers.

Leader of the delegation from the United Kingdom was Stanley J. Harley, Coventry Gauge and Tool Company, Ltd. Leader of the Canadian delegation was J. G. Morrow, Steel Company of Canada, Ltd. Both have been active in former ABC conferences.

Roger Gay, former president of the American Standards Association, and now director of the Defense Department's Standardization, Cataloging, and Inspection program, opened the meeting.

"Much progress has been made in the adoption of unified screw threads covered by the 1948 agreement," Mr Gay pointed out. "We can now focus our attention on items on the agenda to extend this agreement, thus making it more profitable for all concerned."

"In no sense is the conference an effort or a means of setting up an English-speaking, inch bloc to confront the countries in the ISO using the metric system," Mr Gay explained. "While the ABC Conference initially stemmed from the wartime pressure of common defense

problems, none of us can afford to neglect ISO work in the fields in which ABC is concerned."

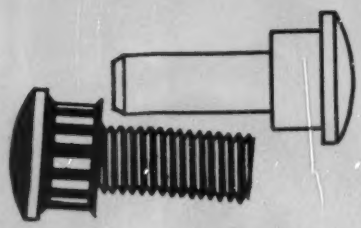
The main purpose of the conference as pointed out by Mr Harley was to examine differences in interpretation of ABC agreements that have developed during the past few years.

Seven principal subjects were under discussion: Gaging of Unified screw threads; elements of screw threads (including Unified screw threads, Unified bolts and nuts, Acme threads, microscope objective threads, and gas cylinder outlet threads); terminology (letter symbols, definitions, and abbreviations); surface finish; limits and fits; miniature ball bearings; and an informal discussion on the general subject of gaging.

The discussions on Unified screw threads included a large number of secondary subjects, such as, extension of the UNF series, designation of screw threads, interference fits, plating, minor diameter of internal threads, miniature screw threads, and acceptability of Unified screw threads and related gaging practices. A draft revision of the American Standard Unified and American Screw Threads for Screws, Bolts, Nuts, and other Threaded Parts, B1.1-1949, was presented to the conference by the USA delegation for consideration. The conference also had before it copies of the most recent British Standards, analyses of differences between UK and USA practice, and a number of technical papers on the points under consideration. In at least one case (miniature screw threads), a draft ISO Recommendation was also under consideration.

Following the previous conference, in 1952, a list of correspondents on each subject in each country had been given responsibility for circulating documents and carrying through on the recommendations of the conference by correspondence. This list was reviewed and brought up to date. A steering committee has been set up to keep the ABC work under continuous review.

Highlights of the session discussions are reported below.



Gaging of Unified Screw Threads—*W. H. Gourlie, Sheffield Corporation, chairman*

A draft revision of the American Standard B1.1, now being completed, includes for the first time the American conception that the limiting pitch diameter sizes are the sizes of enveloping gages. This is a new conception in the standard, it was explained, but has been the position of American industry for years.

The British believe the minimum metal limit for pitch diameter shown in the diagrams of the Unified and American screw threads is misleading. These diagrams portray the profile of a thread with perfect angle and pitch, whereas, according to the British view, the minimum metal limit for pitch diameter applies to one point only at the pitch line.

In the proposed revision of American Standard B1.1, the tolerance is now considered as the "effective size." (The term "virtual size" was proposed by the conference for consideration by Sectional Committee B1.) Variables such as in lead, angle, surface finish, etc, are in addition to the existing pitch diameter tolerance, but the extent of any such variable must not exceed one-half the pitch diameter tolerance. It is recognized, however, that the needs of organizations using fasteners produced by commercial mass production methods differ widely from those of organizations requiring fasteners for design parts, such as the aircraft industry, nuclear works, or similar organizations.

The limiting of angle and lead variables in this latest draft is a considerable step forward in resolving the differences in flank depth of the United States and United Kingdom Not Go gages, in the opinion of the British delegation. The British committee will give consideration to this new approach.

In discussing the interrelationship of tolerances and gaging practice, the Britisn delegation asked USA to consider wider tolerances and more stringent gaging for classes 3A and 3B. The American delegation, in general, held that the tolerances were far too well established to allow change without risk of chaos in industry.

A good deal of discussion was given to the question whether the method of checks used by USA industry is sufficiently severe for commercial products.

As a result of the discussion, the UK delegation agreed to redraft its suggestions[1] as firm proposals and submit comments on the draft revision of American Standard B1.1 to the USA delegation for consideration by Sectional Committee B1.

The British committee is planning to make certain changes in UK gages and to submit them to the USA and Canada before taking final action in order to avoid further divergence in practice among the three countries.

As a basis for further work it was decided to try to reach agreement on over-all pitch diameter tolerances and not to try to reconcile differences on individual feature tolerances such as on lead and angle.

American and Canadian delegates promised to give early consideration to the following British proposals:

(*a*) That all "Go" gages have a wear allowance; the present UK allowance to be reduced slightly, and an allowance equal to that of the UK gage introduced for all USA gages.

(*b*) That the simple effective (pitch) diameter tolerances for "Go" be adjusted—the UK gage being reduced and the USA increased—in such a way that the tolerances of both gages would be equal. In this connection, it was suggested that to assist further in standardization but without curtailing the present UK gage tolerance, it might be possible to introduce

[1] BSI paper CU (MEE) 2426. Recommendation regarding the Addendum of Not Go Effective Diameter Plug Gages for Unified Threads. British Standards Institution, 2 Park Street, W1, England. Copies are also available from the Canadian Standards Association and the American Standards Association.

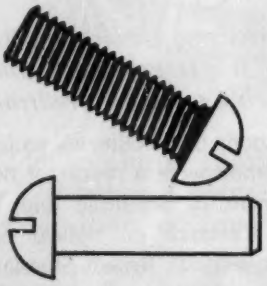
a clause into the standard whereby the gage makers would be permitted to encroach slightly into the pitch angle zone.

Similar proposals were made in respect to the "Not Go" group, it being understood that the UK standard would continue to show only one "Not Go" gage.

Setting Plugs—

It was proposed that the question of setting plugs be referred back to Sectional Committee B1 for further study since it was the opinion of the USA delegation that the proposed revision of American Standard B1 does not truly indicate correct American practice.

Work done in the United Kingdom on strength of screw threads was considered. A considerable program of research is necessary, including tests to show what differences may be expected from inspection by the American and British gaging methods on fatigue and static loading of screw thread combinations.



Plating—*W. P. English, Fairchild Engine Division, chairman*

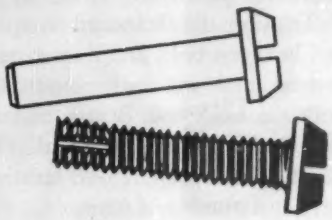
The British reported that they are attempting to establish how much plating is really necessary to give reasonable protection. Then they will decide what tolerance can be allocated to the thickness of plating, and finally determine whether the Unified 2A allowances are sufficient to take care of the coating.

In the USA, introduction of the Unified 2A tolerances has largely overcome plating problems, it was reported.

Further investigation is needed, however, and the UK, Canada, and the USA will keep each other informed of progress.

Minor Diameter of Internal Threads—

Tests carried out in the USA have led to proposed new tables for minor diameter of internal threads in the draft revision of American Standard B1.1. The USA delegation requested the conference to consider revising the minor diameter limits of the Unified threads in Classes 1B and 2B as presented in the proposed revision.

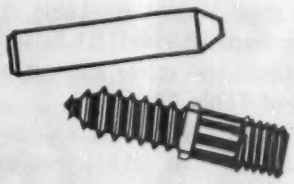


Extension of UNF Series—*W. H. Gourlie, Sheffield Corporation, chairman*

British industry is in need of an extension of the UNF series above 1½ in. for applications in the heavy industry field, the delegation explained. The need is for an 8 threads per inch pitch up to 2½ in. diameter and 6 threads per inch for 2½ in. to 4½ in. The USA delegates pointed out that they had no cause to extend the present series of diameters and pitches for the UNF series above 1½ in. Their 12-thread series meets any such requirement and they feel they cannot agree to the British proposal.

Designation of Screw Threads—

A proposal that all thread data of the Unified pitch-diameter combinations given in the American Standard be included in each standard and the preferred combinations be set out in bold type will be submitted to the British Standards Institution, the Canadian Standards Association, and the American Standards Association for detailed consideration.

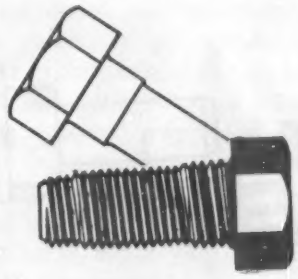


Interference Fits—*T. Affleck, Acton Bolt and Fine Threads, Ltd, chairman*

Data resulting from considerable research on interference fits on screw threads for high tensile steel studs in light alloys were presented by Gustaf Carvelli,[2] Wright Aeronautical Corporation, for consideration by the conference.

In addition, W. G. Waltermire, Lamson & Sessions Company, reported on research conducted by his company in conjunction with the Ford Motor Company and Chrysler Corporation. This has proved that it is practicable under certain considerations for fits to have greater interference than previously thought possible.

As a result of this information, the British committee that has been working on a standard for steel studs in ferrous materials will reconsider the draft. Whenever it is decided to revise British Standard 1171 on high duty steel studs in light alloys, the documents referred to will be given consideration.



Miniature Screw Threads—*E. W. Drescher, Hamilton Watch Company, chairman*

A draft American Standard on Miniature Screw Threads was presented for consideration. The delegates also had before them a draft ISO Recommendation for screw threads 0.25 mm to 5 mm in diameter.

The US and UK committees had already agreed on adoption of diameters and pitches recommended by the ISO for this miniature range.

[2] Data on Interference Fits on Screw Threads. W. G. Waltermire and Gustaf Carvelli. Available from American Standards Association.

The conference agreed to delete the 0.25 mm size which is little used and to suggest this deletion to ISO. A number of other agreements were reached on rounding off metric units and on formula for the pitch.

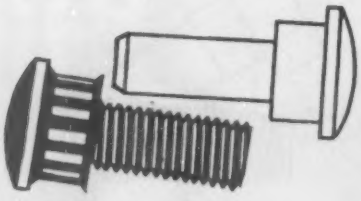
Projection inspection is to be preferred to gaging in these small threads, it was agreed.

Recommendations on measuring practice are to be given in an appendix to the draft American Standard.

Modifications in the appendix on hole size limits in the draft revision of American Standard B1.1 are being considered in accordance with suggestions of the delegates.

Acceptability of Unified Screw Threads and Related Gaging Practices—

From the strategic point of view, a common system of gaging screw threads should be arrived at, the conference agreed. Discussion brought out a number of points concerning the American gaging system, and a proposal for a tolerance equivalent to one-half of the pitch diameter tolerance on the variables, lead, helix, and thread angle.



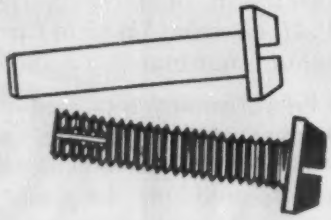
Unified Bolts and Nuts—*H. W. Robb, General Electric Company, USA, chairman*

The American Standard Square and Hexagon Bolts and Nuts, B18.2-1955, which came off the press early this year, was presented by the USA delegation for consideration. The 1951 edition of the British Standards for Unified Precision Hexagon Bolts, Screws and Nuts: Normal Series and Heavy Series, were also before the committee, as well as a draft British Standard for Unified Black Bolts and Nuts: Normal Series.

Because the terminology used in these standards is confusing, it was agreed that cross references should be included pointing out the differences in the terms used by the British and USA committees.

The British informed the American and Canadian delegations that they have decided to adopt closer tolerances than those adopted in the American Standards. They believe the American tolerances on sizes across flats are too large for satisfactory wrenching. They recommended that the USA adopt small tolerances as well.

The Canadian Standard on square and hexagon bolts and nuts is being revised and will be submitted to both the USA and British committees before final approval. The standard will propose new terminology for a number of items.



Acme Screw Threads—*Paul J. des Jardins, Pratt and Whitney Division, Niles-Bennett-Pond Company, chairman*

A draft British Standard for General Purpose Acme Threads and an analysis of differences in UK and USA practice in connection with diameters and pitches of Acme threads and on gaging of Acme threads were before the conference for consideration.

Specific points discussed were diameter pitch series; tolerances; classes of fit; and gaging.

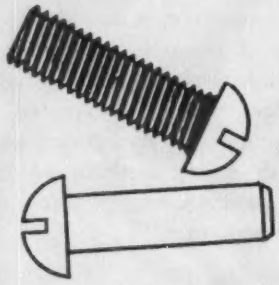
The most extended discussion was on gaging. USA delegates reported they are not entirely satisfied with the requirements for correction and adjustment of the effective diameter of GO ring gages when lengths of engagement exceed the gage lengths in Table 23 of American Standard B1.5-1952. It is planned to revise the test at the foot of Table 23.

Canadian, UK, and USA delegates all agreed that lead errors in the work should not be permitted to reduce the allowance.

It was also agreed that the pitch diameter tolerance for 16, 14, 12, 10, and 8 threads per inch in the upper part of Table 22 of Appendix I, American Standard B1.5, could be the same for all classes.

USA delegates will look into the question of a possible reduction in tolerances on (*a*) half angle of thread for the coarser pitches as given in Column 5 of Table 22, and (*b*) major to minor diameters as given in Column 4.

The UK draft standard on General Purpose Acme Threads is being studied by the USA committee and comments are being forwarded to BSI.



Microscope Objective Threads —*E. W. Drescher, Hamilton Watch Company, chairman*

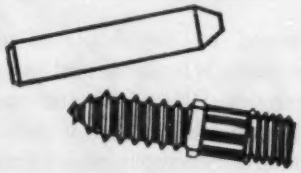
Among the documents under consideration were a report of the Department of Scientific and Industrial Research on optical components; a draft British Standard for Microscopic Objective Threads; and notes on the manufacture and tolerancing of screw threads on optical components, with special reference to the RMS (Royal Microscopical Society) microscope objective thread. A tentative draft of an American Standard was also considered.

The only important difference remaining between the British and American Standards is in the form of the thread, it was pointed out. The American thread is based on the Whitworth form but the design form has flat crests and roots. In the British RMS thread the crests are rounded and the thread has the conventional Whitworth form. Both the American and British product threads will be fully interchange-

able. The British believe, however, that there is possibility of damage to the sharp corners of the American flat crest that may cause misalignment, and a greater chance of "cross threading" due to reduced engagement. It was decided to include an appendix in both the British and American Standard, each to give a condensed version of the other, including thread form diagrams. The text of each standard would also call attention to the differences in crest and root form and consequent major and minor diameter differences.

It was also decided to include a warning note in both standards that the American "Go" plug gage might interfere at the crest of the gage if used to check a British product.

ASA Committee B1 on Screw Threads is being asked to include a paragraph on pilot and undercut.



Gas Cylinder Outlet Threads—*F. R. Fetherston, Compressed Gas Association, chairman*

Detailed drawings of valves now in use in each country will be circulated as a result of agreements reached at this conference. This material is intended to give data for evaluation of the situation in the various countries and for design of safe adaptors for gas cylinder outlets. After these data are circulated, further meetings in future ABC conferences will be held to determine the possibilities of unification of the standards of the three countries.

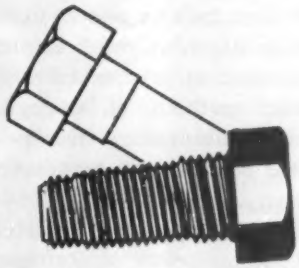
Terminology: Letter Symbols, Definitions and Abbreviations—

The discussion was confined to terminology used in mechanical engineering. It was pointed out that differences in terminology had been evident in every subject discussed so far at ABC conferences. The exact technical meaning ascribed to a term by one country in many cases has not been understood by delegates of other countries, and in some cases has even been contradictory to usage in other countries.

It was agreed that each country would consider setting up a technical committee (or adjusting the scope of an existing committee) to handle terminology in the broad field of mechanical engineering. Current documents and standards will be exchanged among the ABC countries where this has not already been done.

Whenever there is a plenary conference on engineering drawing practice, there will also be an initial survey of the symbols which appear on mechanical drawings, since unification of the symbols is important in unification of the drawing practice itself.

The subject is to be taken up again at the next ABC conference.



Surface Finish—*Dean J. Gerardi, University of Detroit; chairman, Sectional Committee B46, chairman*

Differences between the British and American surface finish standards were discussed. A number of specific suggestions were agreed on, which will be referred both to the British and American surface finish committees. These recommendations were not only acceptable to the British delegation but also to the representatives of the British Commonwealth countries.

Limits and Fits—

The current position in each country was reviewed in the informal discussion. This showed that in sizes up to 20 inches substantial unification has already been achieved. However, in sizes above 20 inches some differences still exist. Important problems also arise in attempting to measure or gage such large sizes.

The BSI "Data Sheets" published in connection with British Standard 1916 were of considerable interest. It was agreed that they may be the subject of ABC discussion later.

Miniature (Instrument) Bearings—

Exchange of technical opinion led to agreement to exchange proposals for miniature bearing standards and to carry on discussion by correspondence. It was explained that in the United Kingdom standardization in metric dimensions is being considered whereas in the USA inch dimensions are being used.

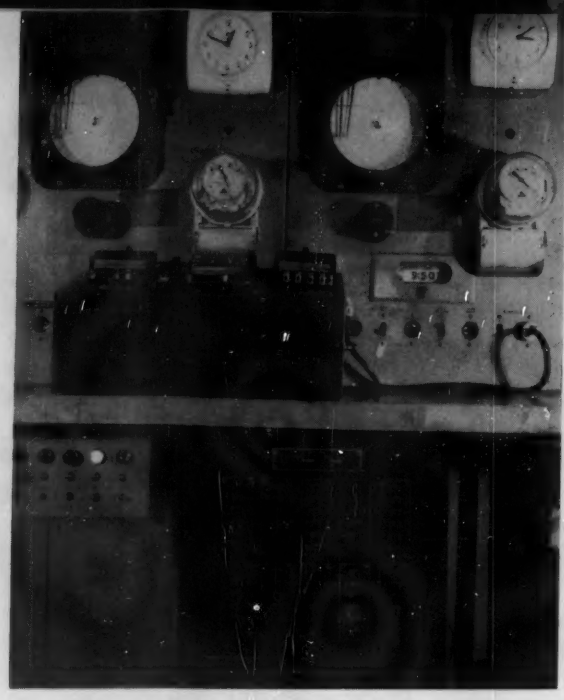
Informal Discussion on Gaging

Gaging principles are pertinent not only in connection with gaging of screw threads but also in the ABC work on Limits and Fits, it was pointed out. Dr F. H. Rolt, British Gauge and Tool Makers Association, urged the group to go further than just to formulate tables for the limits and tolerances for work pieces. In his opinion one should explain first of all just what the figures really mean in relation to the sizes and geometrical forms of the product. Then recommendations should be offered on the methods of controlling the product within the limits, not only by gaging but also by measurement.

During the discussion, problems were touched upon concerning conditions of test; tests for wear of gages; disposition of gage tolerances; standardization of gage components; differences between gaging and measuring as a method of inspection; standards for measuring instruments, including optical instruments.

As a comment on the need for this work, M. B. Shankar (India) commented that his country had adopted British Standard 1580 for Unified screw threads. They, and other members of the Commonwealth, are looking to the UK and USA to arrive at an agreed-upon system of gaging these threads.

How an American Standard was developed



Instruments (*left*) *are set up for testing freezers in accordance with American Standard B38.3-1955. Watt-hour meters show how much current freezer uses; recording instruments keep track of freezer temperatures; clocks record elapsed time. Freezer* (*right*) *is being tested in temperature-controlled test room.*

New Tests Check

by M. C. TURPIN
Secretary-Emeritus, American Society of Refrigerating Engineers

UNQUESTIONABLY, the extensive use of frozen and refrigerated foods by our Armed Forces during World War II did a great deal to expedite their operations and thus, in its own way, contributed substantially to the successful conclusion of that conflict. Due to the great impetus given the refrigerated food industry during the war, following the cessation of hostilities there appeared on the market an avalanche of food freezers. Some, unfortunately, were of a nondescript character, designed and built by persons who did not possess adequate technical knowledge to produce efficient equipment. At one time, it was reported, there were approximately 600 firms or individuals listed as manufacturers of food freezers. There are now some 75 firms listed in this category.

A home freezer is defined as "A self-contained refrigerator for home or farm use in storing frozen foods or in freezing and storing frozen foods." Incidentally, the often used designation "Deep Freeze" is the copyrighted name of one manufacturer, and should only be used when referring to the product of that manufacturer.

It soon became evident to refrigeration engineers and home economists that some standard and accepted methods of testing, and subsequently rating, freezers used in the home should be adopted by industry.

Accordingly, the Council of the American Society of Refrigerating Engineers, at its meeting in December 1944, authorized the appointment of a committee to formulate a testing and rating code for home freezing and storage units. The following year the committee was appointed, with Professor John E. Nicholas of Pennsylvania State College (now University) as chairman. This committee prepared several drafts and made its final report in 1947 after much discussion and conference.

As the findings of the committee did not attain a fair consensus of the industry, a new committee was formed under the leadership of Professor Clare E. Lund, University of Minnesota, with instructions to produce a standard that would meet with the approval of a large segment of the industry. After several meetings and reams of correspondence, the seventh draft was produced and approved by the ASRE Council. The draft was submitted to ASA December 1950, with the request that it be adopted as an American Standard, accompanied by the suggestion that it be referred to ASA Committee B38, the chairman of which is Dr E. C. McCracken of the U.S. Department of Agriculture. Incidentally, Dr McCracken has been a member of each one of the several task committees. The B38 committee is under the joint sponsorship of ASRE and the Home Economics Branch of USDA. In the meantime, the draft had been sent by registered mail to 95 companies, institutions, and individuals interested in the manufacture of home freezers, inviting their comments. Replies received did not indicate any basic objections.

Following its submission to ASA, objections to some of the provisions were raised by certain members of the National Electrical Manufacturers Association (NEMA) which manufacture home freezers.

Accordingly, it was decided to recall the draft from ASA, and to appoint a new task committee representing manufacturers, users, testing firms, and a neutral chairman,

Philco

The American Society of Refrigerating Engineers and the Home Economics Branch of the U.S. Department of Agriculture are sponsors for ASA Sectional Committee B38. Copies of the American Standard for Testing and Rating Home Freezers, B38.3-1955, are available at 50 cents each.

Frigidaire Division, General Motors Corp

Performance of HOME FREEZERS

to confer with NEMA representatives to iron out the differences. This committee, under the chairmanship of Cecil Boling, President, Bush Manufacturing Company, met and did succeed in obtaining a meeting of the minds. The draft with revisions was re-submitted to ASA, which gave it final approval on January 28, 1955. It was later also approved by NEMA.

This somewhat detailed account of the processing of the standard, extending over a period of ten years, is recited to emphasize to readers of THE MAGAZINE OF STANDARDS the thorough care and thought that is used in assuring a consensus of those interested before approving an American Standard.

The standard as finally adopted bears the following inscription: "American Standard Methods of Testing and Rating Home Freezers, B38.3-1955, ASRE Standard 13 Approved: by American Society of Refrigerating Engineers, June 28, 1953; by American Standards Association, January 28, 1955; by National Electrical Manufacturers, Assn, March 17, 1955."

The purpose of the standard is to provide a uniform procedure for rating and determining the performance of home freezers under specified laboratory test conditions. These conditions are not intended to duplicate normal use in the home, but rather to form a basis for laboratory comparisons.

To the public this means that if a user or prospective purchaser of a home freezer knows it has been tested in accordance with the provisions of American Standard B38.3-1955, he can rely on the rating of the freezer. That is, he can rely on its power consumption and percent running time when operated under certain specified conditions. He can have this assurance because the freezer must have been tested under the very definite and rigid conditions specified in the standard. These conditions have been agreed upon after numerous discussions held by the best qualified people in refrigerating engineering and in the home economics professions.

From a technical standpoint, the standard very clearly defines: how to determine the volume or storage capacity (including food storage weight); what instruments to use in the test, the types of temperature measuring instruments, and where they are to be placed; and how the tests are to be conducted and recorded.

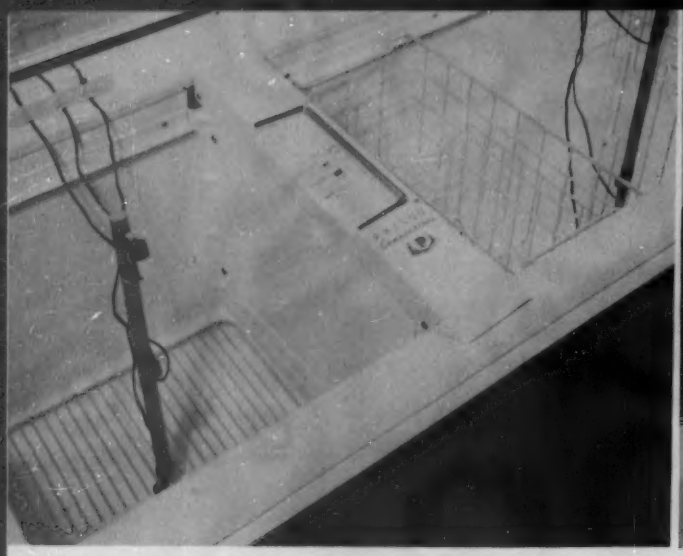
In addition to the No Load Pull Down Test, to be conducted at 110 F, there are two main tests provided: (1) No Load Test, and (2) Storage Load Test. Both these tests are to be conducted at 90 F.

The No Load Test is conducted without any load, data to be taken during two test periods of at least six hours each or one 16-hour period.

For the Storage Load Test, a simulated food load is to be provided consisting of rectangular, moisture-vapor proof fiber cartons, quart size, filled with hardwood sawdust soaked in a solution of sodium chloride. Duration of test is the same as for the No Load Test.

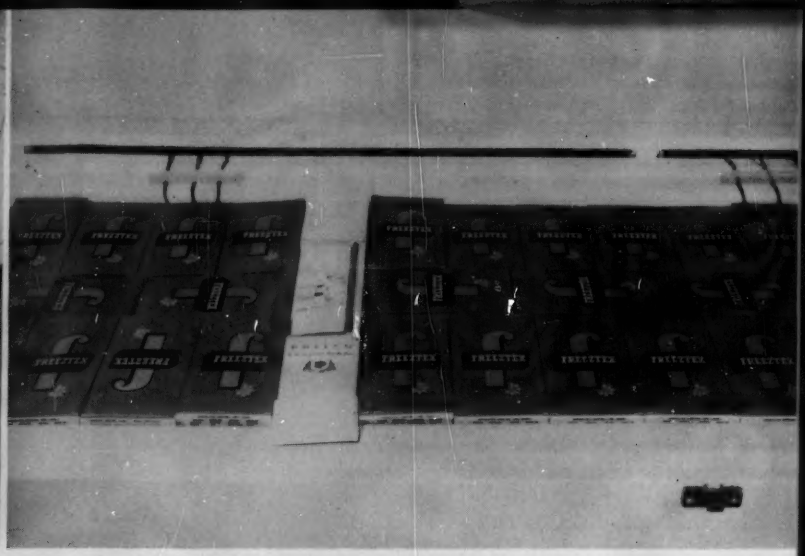
The data to be recorded for the tests are, in addition to name-plate data: duration of tests, ambient temperature, power consumption in kilowatt hours per 24 hours, percent running time, average freezer temperature (No Load Test) and average load temperature (Storage Load Test).

The sponsors believe that they have been instrumental in produc-



Philco

Average temperature *is recorded with freezer unloaded (No Load Test)*



For the Storage Load Test, *rectangular, moisture-vapor proof fiber cartons, quart size, are filled with hardwood sawdust soaked in a solution of sodium chloride to simulate food cartons.*

ing a simple but rigid and effective standard for testing and rating home freezers which, if followed by the manufacturers, will raise the standard of this type of equipment to the ultimate advantage of the user.

• • •

ASRE Policy on Advertising Related to Standards

The American Society of Refrigerating Engineers has adopted a "Policy on Industrial Advertising" as related to ASRE standards. The statement is as follows:

ASRE Standards are established to assist the members of the refrigeration industry and the public by offering a uniform method of rating and testing refrigeration equipment, by suggesting safe practices in designing and installing such equipment, by providing proper definitions of this equipment and by providing other information which may serve to guide the industry. The creation of ASRE Standards is determined by the need for them; and conformance to them is completely voluntary.

In referring to this standard and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASRE.

The following form of statement should be used:

> A representative product sample of the ..... model has been (rated) (tested) in accordance with ASRE Standard No .....

The preparation and adoption of standards for use by the industry is one of the most important functions of ASRE. Its Standards Committee selects, develops, and prepares codes, recommended practices, and standards in the fields of refrigeration and air conditioning. The Society also cooperates closely with other national organizations in this work.

Each ASRE standard is published in *Refrigerating Engineering* before adoption, so that all members and the industry may review it and offer comments and suggestions. The ASRE standards are, with a few exceptions, related to the testing and rating of the various kinds of machinery and equipment forming the refrigeration cycle.

ASRE also sponsors standards issued by the American Standards Association, of which ASRE is an Associate Member. An outstanding example of this type is the ASRE-sponsored American Standard Safety Code for Mechanical Refrigeration, B9.1-1953, which is widely used by municipalities throughout the country.

The following ASRE Standards on Rating and Testing Refrigerating Equipment are in force:

14-Mechanical Condensing Units
16-53 Air Conditioners
18-Self Contained Mechanically Refrigerated Drinking Water Coolers
20-Evaporative Condensers
22-Water Cooled Refrigerant Condensers
23-Refrigerant Compressors
24-Water and Brine Coolers
25-53 Forced Circulation and Natural Convection Air Coolers for Refrigeration

Also the following for which ASRE is the sponsor:

ASA B60.1 Expansion Valves
ASA B59.1 Recommended Practices for Mechanical Refrigeration on Shipboard.

Proposed Standards for Rating and Testing on which ASRE Task Committees are now actively at work include:

PS 2.41 Forced Circulation Air Cooling and Heating Coils
PS 2.5 Plate Coils
PS 2.6 Cooling Towers
PS 3.5 Desiccants
PS 4.4 Bottled Beverage Coolers
PS 4.5 Ice Makers
PS 4.6 Dehumidifiers

Also in preparation are:

PS 3.4 Designation of Refrigerants
PS 6.2 Standard for Comfort Air Conditioning (Joint with the American Society of Heating and Air Conditioning Engineers)

Conference Delegates to Tour NBS Laboratories

DELEGATES to the Sixth National Conference on Standards have been invited to make a tour of the National Bureau of Standards by Dr Allen V. Astin, Director of the Bureau. The tour has been scheduled for October 24 and will last from 2:15 to 5:00 P.M. Members will be taken in small groups to visit laboratories selected so as to present a cross section of the Bureau's work on standards.

The tour of the laboratories will be followed by a tea, providing an opportunity for delegates to meet the senior staff of the Bureau. The tea will be served from 5 to 6 o'clock in the Manse, a large historic mansion on the Bureau grounds.

Members wishing to visit laboratories not included on their tour, or to discuss problems with the NBS staff, are invited to visit the Bureau individually between 8:30 A.M. and 5:00 P.M. on any subsequent day.

ASA members should find much of interest in the program of the National Bureau of Standards. Since its founding in 1901, the Bureau has had a marked influence on the growth of industrial standardization in this country. One of the important functions of NBS as set forth by the Congress is "cooperation with other governmental agencies and with private organizations in the establishment of standard practices, incorporated in codes and specifications." This type of activity has led the Bureau into long and profitable association with both ASA and the old American Engineering Standards Committee.

NBS work on safety codes for gas and electricity began in the early years of this century. In 1910, a special assignment to investigate hazards arising from distribution of high-voltage electrical energy led to the development of the National Electrical Safety Code. The Bureau later became sponsor for this code under ASA procedure. Application of the electrical safety code during World War I brought requests for work in other areas. By 1920 the Bureau had agreed to sponsor seven codes under the AESC program.

Today NBS is sponsor under ASA procedure of the safety codes for electrical safety; protection against lightning; protection of heads, eyes, and respiratory organs; logging and sawmills; industrial use of x-rays; elevators, dumbwaiters, and escalators; specifications and methods of test of safety glass; and electrical fences.

In addition, the Bureau is sponsor for a number of other ASA projects, such as dry cells and batteries and testing sieves. In all, ASA has approximately 240 committee assignments distributed among the Bureau staff.

Underlying the Bureau's work in codes and specifications is the NBS program of research and development in physical standards, measurement methods, and properties and constants of materials. This program is designed to meet the constantly increasing demands of science and industry for new and improved standards and for more precise measurements.

Open Laboratories

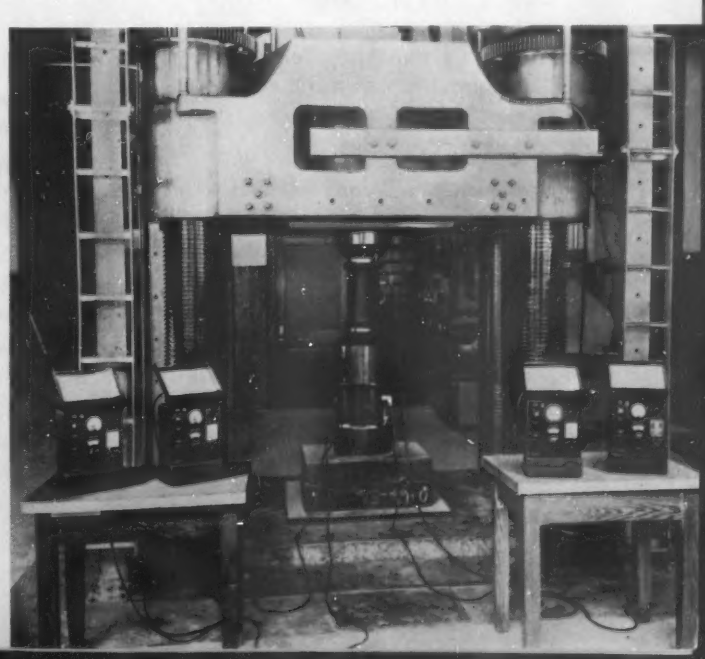
Each delegate will visit eight of the 12 NBS laboratories carrying on work in the fields listed below:

National Standards of Measurement

The National Standards of length and mass are basic to every commercial transaction in the United States. There are approximately 4.5 million weighing scales in the U.S. which are used in determining the value of billions of dollars worth of goods annually. Goods that aren't weighed are often measured. But equally important, these two standards underlie nearly all science and manufacturing, from the production of electric power to the building of jet aircraft. Made of an alloy of platinum and iridium, the standards are preserved in a newly remodeled vault.

Electrical Standards and Measurements

The Bureau has developed very precise standards of electrical resistance and voltage whose values are established by absolute measurement that fix the relation between the electrical units and the fundamental mechanical units of length, mass, and time. From these basic absolute electrical standards, the Bureau has derived other standards for the measurement of all other electrical quantities — like inductance, capacitance, and power—essential to the manufacture of electrical and electronic equipment.



This 10-million lb compression testing machine — *largest in the world—is one of the pieces of equipment to be seen in the Bureau's Laboratory on Strength of Structural Equipment.*

Radiation Physics and Standards

The NBS radiation physics laboratory performs basic and applied research in specific areas of medical, biological, and industrial radiation. Such work includes the measurement of x-ray dosage and the study of radiation hazards. Part of the equipment used to study the effect of radiation on human beings, structures, concrete, and lead includes a 1.4-million-volt constant-potential x-ray machine, a Van de Graaff generator for obtaining neutron beams, and other smaller x-ray units for standardization work.

Strength of Structural Materials

Knowledge of the strength of materials is most often obtained from actual tests of components or full-scale structures. The accuracy of equipment that is used in such tests depends on the precise measuring standards of force maintained and calibrated by the Bureau's engineering mechanics laboratory. Facilities include unique equipment such as deadweight testing machines, large proving rings, 3-million-pound compression dynamometers, and a 10-million-pound compression testing machine—the world's largest.

Fatigue of Metals

Fatigue failures of metals often cause heavy loss of life and severe property damage. Fatigue properties of structural materials are therefore important in mechanical design. The fatigue testing laboratory seeks a better understanding of the behavior of metals under fluctuating load. These data may then be used in improving fatigue strength. The laboratory is equipped with a wide variety of machines for applying fluctuating loads to metal specimens in the form of bars, plates, sheet, and wire.

Organic and Fibrous Materials

Fibrous materials are used, among other things, for safety belts, airplane tire cords, and paratrooper static lines. In such uses the materials must withstand very high-speed impacts. To assist industry and government in the solution of basic technical and scientific problems in the development, production, and specification of fibrous materials, the Bureau has built precision equipment for measuring the properties of fibers, yarns, and fabrics under high-speed impact.

Optical Glass Research

Though the art of making glass has been known for centuries, it has been only comparatively recently that scientists have attempted to put glassmaking on a sound scientific basis. Basic information resulting from a continuing study of the physical, chemical, and mechanical properties of simple glasses has proved useful in projects where glasses are being developed to meet certain specifications. In studying glass, the Bureau uses small electric furnaces capable of making melts of from one to 15 pounds. Also in use are instruments for measuring surface tension, viscosity, liquid temperature, thermal expansion, heats of solution, and softening point.

Analysis of Metals—Standard Samples

Automatic spectrometers are now employed in industry for rapid control of composition in the production of metals. Before they can be used effectively, the instruments must be calibrated by means of standards of known composition. For such calibrations, the Bureau prepares and issues standard samples of high uniformity and accurately determined composition. These standard samples represent only a few of the more than 500 different varieties of chemicals, ores, ceramics, and metals distributed by NBS for use in controlling chemical process and in maintaining the accuracy of apparatus and equipment.

Properties of Matter at Low Temperatures

Low-temperature research at the Bureau is mostly concerned with phenomena at temperatures below 20 K (the boiling point of hydrogen on the "absolute" scale) down to absolute zero. At these temperatures the properties of matter undergo extraordinary changes. For example, metals such as lead and tin, ordinarily poor conductors of electricity, become superconductors with complete loss of electrical resistance. Also, near absolute zero liquid helium will flow through constrictions without resistance. Because the field of low-temperature physics is undergoing rapid development, new measurement methods and standards are needed that will be reliable in the extreme low-temperature range. The Bureau works in both these areas—measurement standards and properties of materials — in its low-temperature laboratory.

Standards of Measurement at High Temperatures

Melting turbine blades and "flame out" in modern jet engines emphasize the lack of basic information on temperature measurements. One of the objectives of the NBS high-temperature laboratory is to obtain fundamental data required for more efficient and safe use of all high-temperature engines—rockets and gas turbines as well as jets. To accomplish this purpose, the Bureau is studying many methods of temperature measurement in flames and devising standards for temperature measurement in hot gases.

Hearing and Noise

The basic standard for research in the measurement of sound and noise is derived from a standard technique for calibration of microphones. NBS uses the standard reciprocity technique to calibrate microphones which in turn serve as standards for measurement of hearing. The Bureau has also standardized a method for measuring the sound transmission loss of building construction. As a result, constructions measured by the standard method in various laboratories can now be conveniently compared by the architect who needs the sound transmission loss information in his daily work.

High-Speed Electronic Computers

SEAC, the Bureau's electronic computer, was the first automatically sequenced machine put into scheduled operation in this country. Its use ranges from scientific problems such as shielding against nuclear

Continued on page 255

the case for Decimal Dimensioning

by CHARLES M. WRIGHT

Standard Oil Co. (N.J.)

U.S. Steel

Charles M. Wright, Standards Engineer in the Engineering Division of the Chrysler Corporation, represents the Society of Automotive Engineers on a number of sectional committees under the procedure of the American Standards Association. Among these are B1, Screw Threads; B2, Pipe Threads; B18, Bolts and Nuts; and B27, Washers.

This paper was prepared for presentation at the Spring Meeting of the Company Member Conference at Milwaukee, Wisconsin. Because Mr Wright was ill, it was presented for him by Roy Trowbridge, of the General Motors Engineering Standards Department.

LAST year I asked for your assistance and support in development of an American Standard for decimal scales. With your generous help, that standard has been brought very near to completion and I anticipate that it will be finalized and published within a very short time.[1]

In a sense, the development of the decimal scale standard was an emergency project to meet the need of industries which had already converted to the decimal inch system of dimensioning. Standardization of scales preliminary to standardization of a system of decimal dimensioning could be likened to "putting the cart before the horse." It was, nevertheless, considered necessary in order to arrest an increasing trend toward individuality in the specification of decimal scale design and calibration—a practice which was costly and inconvenient to both producers and users of the scales.

Widespread recognition and use of the scale standard will probably make circumstances more propitious for standardizing a system of decimal inch dimensioning. As you can see, I am trying to justify putting the cart before the horse by what may turn out to be wishful thinking, that standardization of decimal dimensioning has thereby been rendered easier. Before talking on the advantages and principles of a standard decimal dimensioning system, I will lead up to the subject by reviewing briefly the history of dimensioning and measurement as we know it today.

It has been said that the ancients measured by a rule of thumb. Literally, it was not always the thumb. A cubit in Noah's day was the distance from a man's elbow to the tip of his middle finger. In the 12th century, the foot was the length of the actual foot of the ruling monarch. Sometime later, the rod was equal to the total length of the left feet of 16 good men as they emerged

[1] The Proposed American Standard, Scales for Use with Decimal-Inch Dimensioning, Z75.1, was recommended for approval by a General Conference and is now before the Mechanical Standards Board.

from church on Sunday morning. The inch at one time was the width of a man's thumb and 12 times that width was considered a foot. In the Fourteenth Century, a standard inch was decreed as equal to three barley corns taken from the middle of the ear and laid end to end.

About the time Columbus discovered America, England adopted the yard as a basis of measurement and some three centuries later legalized a standard yard, the length of which was controlled by a metallic bar. England sent a replica of that bar to this country and about the same time we also received from France a metallic bar which was based on the meter. Both bars are in Washington in the custody of the National Bureau of Standards.

Despite opinions to the contrary, the United States has never legalized a primary standard of length. The yard, the foot, and the inch are our common standards and, if at any future time, there is to be legalization of a primary standard length, it should properly be one of those three established units. While on this subject of legalization, I would like to mention that it has been widely publicized that the Act of 1866 legalized the metric system. The fact is, that the Act of 1866 did nothing more than define the meter in terms of the yard—our common standard—without any implication whatsoever that the meter was being approved as a primary standard.

I have brought the metric system into this discussion for two reasons: First, to avail myself of the opportunity of opposing its general adoption in this country; and second, to point out that the only significant advantage of the metric system is that its units are all multiples of ten—a decimal ratio which greatly simplifies calculations and specifications of dimensions.

Until the start of this century, common fractions were generally adequate for engineering dimensions. By then, however, industry was undergoing a revolutionary change. Products were becoming more complicated and manufacturing plants more specialized. Interchangeability of parts was the order of the day and mass production, as we know it, was just getting started. Interchangeable parts required greater accuracy in manufacture, which in turn necessitated smaller tolerances and recourse to decimals for their specification on drawings. Micrometers, vernier gages, Johannsen blocks, and the controls of many machine tools were already calibrated in decimals of an inch, which added impetus to the general trend away from fractions and toward substitution of decimal inch dimensioning. This trend was gradual until the early thirties when a few large manufacturers began to appreciate that there were economies involved in the design, specification, and manufacture of products on the basis of decimal dimensioning. The Ford Motor Company, the aeronautical industry, and the Society of Automotive Engineers, were among the pioneers in adopting and promoting the use of decimal dimensioning. Metric propagandists themselves, by ballyhooing the advantages of decimal ratios in multiples of ten, in effect accelerated the trend to a decimal-inch dimensioning system, thereby contributing to the defeat of their own objective. This latter, of course, would have involved the adoption of a new unit of measurement, a costly changeover which would require re-education for a generation or more.

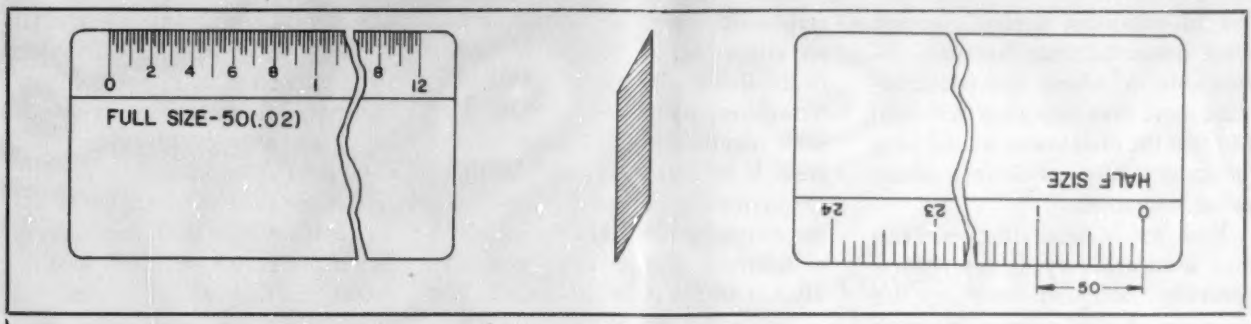
"What an opportunity was missed when the hand lift truck was invented and its use first promoted. The original manufacturer decided that a 6-inch lift truck was adequate. The next fellow decided that a 7-inch truck would pull more easily. Along came someone else who figured he would jump the gun and give a 9-inch truck. Then along came the electric truck people and said 'Let's integrate, but our wheels won't stand up unless an 11-inch wheel is used,' so the 11-inch size was born! And all this while each manufacturer was losing his original advantage because they each began making 6-, 7-, 9-, and 11-inch trucks."—*From "Standardization's Neglected Field—Materials Handling," by Nathaniel Warshaw, National Safety News, June, 1954.*

So we can now congratulate ourselves on obtaining the most significant advantages of the metric system without surrender of our traditional units of measurement and their own inherent advantages of fractional breakdown when such divisions are the most convenient.

Just what is a decimal system or a decimal dimensioning standard? Why is a standard necessary or desirable? We were all taught decimals in grade school. We use them in our monetary system, and in the engineering field we are familiar with tenths, hundredths, thousandths, and ten thousandths of an inch. In fact, recently we have learned to think and talk about millionths of an inch in connection with surface roughness. It could well be contended that decimal specifications have already been systemized and standardized and there is no need for a decimal dimensioning standard. Quite honestly, I will admit there is no need, if need is to imply an absolute necessity or requirement. On the other hand, many things that are unnecessary in a strict sense may still be convenient or even expedient, or both convenient and expedient, all circumstances considered.

Standardization of scales was not necessary in a strict sense, as an unlimited variety was available on order, permitting everyone to exercise his own preferences as to calibration, direction of reading, etc. Despite the multiplicity of choice, all scales were still strictly in conformity with the decimal system. However, in this instance, expediency, economy, and convenience, rather than necessity, prompted the standardization project. It was recognized that standardization of scales and their calibration would permit manufacturers to produce them in large quantities, stock them for quick delivery, and sell them for a reasonable profit at a much lower figure. It was also realized that engineers and mechanics would become more familiar with the use of the scales if their pattern were standardized in essential detail.

As for standardization of a system of decimal dimensioning, I con-



One style of marking *for full size and half size drafting scales for use with decimal-inch dimensioning is shown above. This style will be available in 12-inch length and 1.30 in. width. The thickness is to be as specified or subject to agreement between manufacturer and purchaser. The style shown at left is for shop scales and will be graduated on one face only. Length will be 6 and 12 inches, 0.50 in. wide and 0.016 in. thick.*

cede that there is no necessity. However, let us examine the matter from the standpoint of expediency and convenience. We have a system of dimensioning which is now being used by some of the largest mass production industries in this country. The system has also been adopted by hundreds of smaller companies. There is evidence that the trend to adoption of that system has accelerated in recent years, and there is a definite prospect that, in time, all industries in the mechanical field will use some system of decimal dimensioning. As uniformity in practice is an advantage in itself, anything that will hasten the day of complete conversion by the mechanical trades to decimal dimensioning systems could be classified as expedient. A standard would have the advantages of advertising, and educational value which would serve to acquaint and interest other industries with the subject, convince them of the merits of decimal dimensioning, and assist them to put it into effect in their own organizations.

A standard would also be convenient in that it would constitute documentation of a preferred or recognized procedure for decimal dimensioning. A procedure or standard is a convenience and a saver of time and money.

To explain the principles of a procedure which has already been adopted by hundreds of companies, and which may serve as a basis for development of an American Standard, first, we should understand the terminology which defines the scope of decimal dimensioning. References are frequently made to the complete decimal system of dimensioning. There seems to be a little confusion as to what the word "complete" implies. In some quarters it is intended to mean a system in which all linear dimensions are expressed in decimal values. In others, exceptions are made of fractionally designated commercial parts or tools and certain dimensions such as angles, nominal values, etc. For example, when mass production industries started to adopt the decimal system, exceptions were usually made when it came to fractional dimensions applying to bolts, rivets, cables, angles, thread sizes, drills and materials such as rods, bars, plates, etc. The trend in the last few years, however, has been toward a more complete application without any specified exceptions and with the understanding that exceptions which may be necessary for specific applications should be kept to a minimum. I believe that is the best basis for application of the system. It may make conversion a little more difficult to begin with but, on the other hand, it does not introduce doubt as to where the system should apply and it leaves to the discretion of the user whether he wants to make an exception.

Although drills are still called out fractionally in most manufacturers' catalogs, thousands of companies have long since either supplemented drill and wire sizes with a decimal value or have omitted the number, letter, or fractional size and substituted the decimal size. The same may be said of sheet metal gages and their qualification or substitution by decimal values. I favor across the board conversion if for no other reason than to avoid confusion and uncertainty.

A decimal system for dimensioning engineering drawings can usually be limited to two-place, three-place, or four-place decimals, the unit value being understood as one inch unless otherwise specified, as it would be in calling out roughness values in microinches.

The number of decimal places in a dimension should carry no connotation as to the accuracy required. When they see three or four decimals, however, many engineers consider the dimension more important or precise than a one- or two-place decimal. Actually, 0.1 in. is the same dimension as 0.10 in. or 0.100 in. Be that as it may, it is pretty well established in the decimal dimensioning systems now in use (1) that a decimal consisting of two figures after the decimal point shall be the minimum or basis so that all decimal values are expressed in no larger increments than hundredths of an inch; (2) that no tolerance should be implied by the number of decimal places in a dimension; (3) that all dimensions should be speci-

fied in two-place decimals except when converted from fractional dimensions or where tolerances require more than two-place decimals; (4) that the dimensions should have the same number of decimal places as the tolerances.

Now for a detail that, while it may seem arbitrary, is nevertheless generally accepted and applied wherever design permits by most organizations using decimal dimensioning: the inch is divided into tenths such as 0.10, 0.20, 0.30, etc, and even hundredths such as 0.02, 0.04, 0.06, etc, the smallest increment of the hundredths being 0.02.

Specification of even numbers in the second decimal place permits them to be divided into a decimal of two places, whereas a two-place decimal ending in an odd number would require specification of three places in the halved dimensions. Therefore, dimensions which are divided into two or more equal spaces, as between equally spaced holes, should be such that the resulting dimensions will be a two-place or hundredths increments. Where the design requires over-all dimensions which, when divided into two or more equal spaces result in dimensions expressed in three places, those three-place dimensions should be rounded off to two places wherever design permits.

No control is established over the odd or even characteristics of the last digit in three- or four-place decimals. Whether they are even is generally dependent on design considerations, decimal equivalent of fractions, or the effect of applied tolerances.

How Many Decimal Places?

It has been said and widely publicized that when the tolerance applied to a dimension is plus or minus 0.01 or greater, two-place decimals should be used; where the tolerance is less than plus or minus 0.01 and not less than plus or minus 0.001, three-place decimals should be used; and where the tolerance applied to the dimension is less than 0.001, four-place decimals should be used. I am afraid that this is confusing and would much prefer to emphasize again that no tolerances are implied by the number of digits in the dimension, but only that the dimension should always have the same number of places as the tolerance. If we go any further than that simple statement, some people get the erroneous idea that the amount of tolerance is dependent upon the number of places in the dimension.

Just a few words about the economic advantages of a decimal dimensioning system. I understand that tests have been made which have indicated that it takes approximately five times as long to add fractions as it does decimals. Fractions, if converted to decimals, may run as high as six decimal places and these, if added up, will later have to be converted back to fractions for the result of the calculation. The advantages of decimal dimensioning are not confined to the engineering department as it also simplifies the calculations required by the tool and die makers and the layouts required by mechanics and sheetmetal workers.

The present extensive use of electric motors and lamps would have been impossible had it not been for the collective standardization carried on in the electrical industry, not only in fundamentals such as voltages and frequencies, but also in such details as the interchangeability of lamp bases and sockets.
—Cyril Ainsworth, Technical Director, American Standards Association.

We in the Chrysler organization have had only about one year's experience with the decimal dimensioning system. No appreciable difficulty was experienced in converting and reports from our engineering, production, and inspection departments have been almost 100 percent favorable to the change. Conversion was made with the understanding that it would apply to new drawings and design and would not be retroactive. In many instances, however, on change of old drawings, the dimensions have been converted to decimals.

I have been informed that a number of manufacturers have converted to the decimal system without any indoctrination program, educational meetings, bulletins, etc. At Chrysler, however, we felt that some publicity might be advantageous. Accordingly, we arranged for the subject to be brought up at engineering and production staff conferences to assure that key men in all departments would be familiar with it to such an extent that they would be qualified to answer any questions they were asked regarding the system.

Auto Industry One Among Many Users

I have attempted to present this subject without prejudice or bias. Statements have been made that the automotive industry is promoting adoption of the decimal system. If that means what it sounds like, that decimal dimensioning of engineering drawings is an exclusive automotive project, I can assure you that the statements are incorrect. In GM, according to my understanding, a number of years elapsed between the time a few divisions wanted to adopt the decimal system and the time that all divisions received the green light to go ahead in accordance with their individual preferences. The Chrysler Corporation itself was one of the holdouts because, as I noted before, we converted only about one year ago. The Ford Motor Company, it is true, converted to the system some 25 years ago, at which time many other companies in the U.S. were already using the system. In the interim, there have been hundreds if not thousands of concerns that have also converted, particularly in the aeronautical industry. If I thought this was an invention or discovery of the automotive industry, I would not hesitate to publicize the fact or even brag about it. No discoveries or inventions are involved, as the trend to decimal dimensioning has been an evolution rather than a revolution.

I want to thank all the participants in the ASA general conference on decimal scales for cooperation and support in promotion of a project which I honestly believe will save American industry millions of dollars a year.

Caterpillar Tractor Co.

Lockers shown here *have perforations in base to help keep clothes fresh.*

by CHARLES D. YAFFE

Dr Yaffe is Chief of Program Services, Division of Special Health Services, U.S. Department of Health, Education, and Welfare, and Secretary, ASA Sectional Committee Z4.

Minimum Sanitation Requirements Now Apply to Stores, Offices

EMPLOYEES working in stores and offices are entitled to the same minimum sanitary facilities as are those in manufacturing establishments. This is the principle recognized in the 1955 edition of the American Standard Minimum Requirements for Sanitation in Places of Employment, Z4.1-1955.[1] The new standard is a revision of a 1935 edition which applied only to "places of employment in which articles are manufactured, repaired, cleaned, sorted or renovated . . . for profit, sale, or compensation." Now the only places omitted from the minimum sanitation requirements are those in which only domestic, mining, or agricultural work is performed.

In revising the 1935 edition, Sectional Committee Z4 made a thorough reappraisal of its recommendations. It is the opinion of the committee that the new edition is now well suited to help keep places of employment in a healthy condition. It recommends that employers use the standard to check sanitary conditions in their own plants, offices, and work shops. The committee also believes the standard is well suited for use as a guide when new work places are being built or existing ones expanded. For example, how many wash basins should there be if a company employs 20 women? Should shower baths be supplied? When are dressing rooms needed? These and other similar questions are answered in the standard.

To make it easy to use the standard the material has been rearranged and set up conveniently under major headings. These headings indicate the type of information included: General requirements; light and ventilation; water supply; toilet facilities; washing facilities; change rooms; retiring rooms for women; lunch rooms; and food handling.

The provisions contained in the standard are not lengthy but present in usable form the fundamental principles to be followed to insure a sanitary environment. Included is material covering design, construction, and maintenance aspects. Where greater detail might be of interest, reference is made to authoritative guides covering specific subjects.

Deleted from the new standard, however, are all references to the control of toxic vapors, fumes, gases and dusts, since these represent specific problems which the committee considered to be outside the scope of this document, and which can only be covered adequately by special regulations.

The United States Public Health Service is the sponsor of this standard, as it was of the 1935 version. Public Health Service participation is based, of course, on the voluntary nature of the standard and its use, where adopted, is subject to the requirements of Federal, State, or local authorities in the exercise of regulatory authority.

[1] Copies of American Standard Minimum Requirements for Sanitation in Places of Employment, Z4.1-1955, are available at 50 cents each. Quantity prices on request.

NEWS BRIEFS

• The American Society of Civil Engineers announces appointment of its new Committee on Standards. Clarence A. Willson, Research Engineer, Committee on Reinforced Concrete Research, American Iron and Steel Institute, is chairman. Mason C. Prichard, executive vice-president, Foundation Company, New York, is vice-chairman. Other members are Charles W. Bryan, Jr, President, Pullman Standard Car Manufacturing Company, Chicago, and Professor William S. LaLonde, Jr, Newark College of Engineering, Newark, N.J. Mr Bryan is a member of the Board of Directors of the American Standards Association. Mr Prichard is a member of the Construction Standards Board; and Mr Willson is a member of the Standards Council.

Purpose of the ASCE Committee is outlined in the Society's by-laws:

"The Committee on Standards shall coordinate all activities of the Society related to the establishment, use, or discontinuance of national technical standards and building codes. It shall make recommendations to the Board of Direction concerning the endorsement of standards or building codes, and appointment of representatives of the Society on standards boards or committees operating jointly with other societies in the standards program.

"The committee shall have a chairman appointed by the Board of Direction and three other members also appointed by the Board of Direction, all of whom shall have served on standards or building code committees on which the Society is represented."

• "To create standards is one thing —to cause them to be used is something else again," Ephraim Freedman, Management Councillor and Director of Macy's Bureau of Standards, told the Consumer Symposium of the New York State Home Economics Association Convention in April. Mr Freedman is chairman of the Consumer Goods Standards Board of the American Standards Association.

"The most noteworthy consumer standard currently in existence is L22—American Standard Minimum Requirements for Rayon and Acetate Fabrics," Mr Freedman told the convention. "This standard was sponsored by the National Retail Dry Goods Association and approved as an American Standard in 1952. . . . It is an outstanding, comprehensive compendium providing the means for evaluating in terms of acceptability or nonacceptability, 24 varieties of textile fabrics employed in the manufacture of men's, boys', women's, and girls' wearing apparel and of home furnishings."

Leading retailers would be more than pleased to see merchandise carry informative American Standard tags making this information available to the public, Mr Freedman said. However, neither piece goods nor garment manufacturers have, as yet, shown much enthusiasm for them, and strange as it may seem, consumer demand for these tags, except sporadically, has been nil.

There is widespread looseness of language displayed on many labels affixed to textile products, Mr Freedamn declared. This continues to result in consumer dissatisfaction.

The National Retail Dry Goods Association has drafted a Uniform Labeling Bill, otherwise known as the Textile Fiber Products Labeling Act which it hopes eventually will be enacted into law.

The National Retail Dry Goods Association is also sponsoring the development of a larger project covering minimum end use requirements for all textiles, Mr Freedman explained. This project, known as L25, is in the technical stage of development.

He urged home economists to help bring into the standards work representatives of consumers who have the technical ability and the willingness to pitch in and help develop practical, workable consumer end-use standards.

WHAT IS YOUR QUESTION ?

Is there any principle to follow in rounding off decimals in decimal dimensioning?

Numbers should be rounded to to the nearest decimal place. The ASTM standard, "Recommended Practices for Designating Significant Places in Specified Limiting Values, ASTM E 29-50, outlines principles that are helpful in this connection.

Is a new edition of the code for design of transmission shafting, B17c-1927 being developed since the 1927 edition has now been withdrawn?

Approval of this American Standard was withdrawn by the American Standards Association on recommendation of the sponsoring organization. No further work is planned on this subject as the sponsor has also discharged sectional committee B17.

Is there any way of converting easily to decimal dimensioning on items where fixtures and gages have been developed previously on fractions of an inch?

Until there is a major design change on any particular item a change from fractions to decimals of an inch should be treated cautiously. Those items that are subject to change within one or two years can be converted easily; other items may not undergo a radical change for some 15 or 20 years and in that case the conversion to decimal dimensioning would be difficult in less than that time.

How Materials and Supplies Are Inspected by the General Services Administration

By S. P. Kaidanovsky

THE authority and responsibility for inspection is vested in the Administrator of General Services as set forth in Section 201(a) of the Federal Property and Administrative Services Act of 1949. This section reads in part as follows:

"The Administrator shall in respect of executive agencies, and to the extent that he determines that so doing is advantageous to the government in terms of economy, efficiency, or service, and with due regard to the program activities of the agencies concerned

"(1) prescribe policies and methods of procurement and supply of personal property and nonpersonal services, including related functions such as . . . inspection, . . .

"(3) procure and supply personal property and nonpersonal services for the use of executive agencies . . . and perform functions related to procurement and supply such as those mentioned in subparagraph (1)"

The Inspection Division, previously the Inspection Branch of the Standards Division, has been established by the Administrator of General Services, Edmund F. Mansure, as of January 17, 1955.

Organization of the Inspection Division

The Inspection Division, O. W. Teckemeyer, Director, is made up of the Commodity Branch and the Policy and Procedure Branch, as shown on the organization chart.

Commodity Branch. This Branch, Herbert M. Neal, Chief, performs the following functions:

1. Develops technical inspection procedures for specific commodities, and coordinates and assists in solution of field inspection problems in connection with Emergency Procurement Service (EPS) purchases of new materials, beneficiation of subgrade materials, surplus, scrap conversion, and storage;
2. Prepares and maintains manuals for inspection of purchased materials and materials in storage; and
3. Coordinates regional inspection, checks contract progress and provides technical assistance to the purchase, storage, and transportation groups in the General Services Administration and other executive agencies.

The Branch is made up of four commodity sections and the Mail and Files Section.

The Commodity Sections perform the functions described above, each one as they relate to the following commodities:

Section 1. Metals and ores
Section 2. Shellac, quebracho, drugs, oils, agricultural and chemical products
Section 3. Cordage fibers, graphite, precious metals, quartz, mica block talc, jewel bearings, refractory lining materials, mineral products, machinery and equipment, and other related products.
Section 4. Crude rubber.

Mail and File Section. This Section maintains the Branch files of contracts, correspondence, reports, and other documents on all programs involving the Branch.

Policy and Procedures Branch. This Branch, Ralph M. Lockhart, Chief, performs the following functions:

1. Develops policies and methods to coordinate and utilize existing Federal inspection and testing facilities.
2. Conducts research of inspection and testing techniques and methods.
3. Develops policies, procedures, and regulations governing inspection and testing activities of the General Services Administration and other agencies.
4. Prepares and maintains inspection manuals, and
5. Makes studies for development of inspection interchange agreements and establishment of quality control procedures.

Policies and Procedures

Policies and procedures for the inspection, sampling, and testing of materials, supplies, and equipment by Federal Supply Service inspectors are prescribed by the Administrator of General Services in Manual GS5, Personal Property Management, Volume GS 5-5, Inspection and Testing. This Manual also describes policies and procedures for various related inspection activities, such as expediting the inspection of materials in storage or warehouse locations, and investigations of complaints concerning the quality of materials supplied through the Federal Supply Service.

Procurement Programs

1. *National Stockpile Program.* Inspection and expediting of strategic and critical materials acquired for the National Stockpile by the Emergency Procurement Service. This program also includes the inspection

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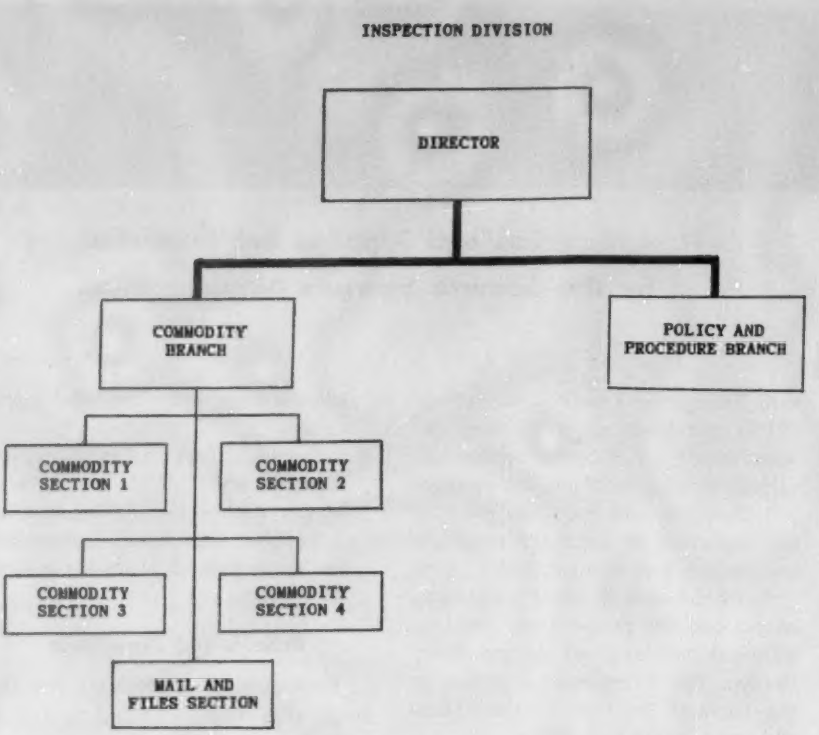
Mr Kaidanovsky is Technical Director of the Management and Technical Services, New York. He was formerly chairman, Federal Interdepartmental Standards Council; technical consultant, Federal Specifications Board; and editor, Standards World.



O. W. Teckemeyer
Director, Inspection Division, Federal Supply Service, GSA

of materials in storage and storage facilities.

2. *Special Purchase Programs.* Inspection and expediting of materials purchased by the Emergency Procurement Service and the Federal Supply Service for shipment overseas, other than island territories.

3. *Defense Production Act (DPA) Program.* Inspection of all material acquired with DPA funds under contracts entered into or administered by Emergency Procurement Service.

4. *General Supply Fund Program.* Inspection of items purchased by the Federal Supply Service for stores reissue and for direct delivery to Federal agencies, including overseas shipments to island territories.

5. *Operating Expenses — Federal Supply Service Program.* Inspection of excess property, materials, and services supplied under national and regional Federal Supply Schedule contracts, and any other activity not specifically designated under a purchase program.

Inspection Activities

Ultimate Objective of Inspection. To determine whether the material as submitted meets specifications and technical contract requirements, resulting in acceptance or rejection of the material.

Types of Inspection Activities

(a) Visual inspection
(b) Spot inspection during processing or production
(c) Inspection of units prior to assembly
(d) Inspection of final assembly
(e) Inspection or verification of excess property
(f) Inspection of repacking or remarking
(g) Witnessing of physical or performance tests
(h) Witnessing of sampling by a commerical sampler-analyst
(i) Witnessing of unloading or outloading
(j) Checking for packing and marking
(k) Checking for quality and weight
(l) Selection of samples
(m) Preparation of laboratory samples
(n) Investigation to determine whether a contractor shall be permitted to ship under quality assurance inspection procedure
(o) Acceptance
(p) Release of shipment
(q) Rejection
(r) Any other type of activity related to inspection.

Specifications Review. The Inspection Division, Central Office, and the regional Inspection Divisions review new specifications and revisions or amendments to old specifications with a view toward possible improvement when requested by the Standards Division. Because of previous experience with the production of the item in the manufacturer's plants, the inspectors can often improve the inspection requirements of the specifications, as well as suggest technical improvements of the product.

Statistical Sampling

Statistical Sampling is primarily used by the Inspection Division in the inspection of items purchased by the Federal Supply Service. The sampling procedures provide for the use of statistical sampling tables which give the size of a representative sample to be selected from a given lot size, the acceptance number, or the rejection number. These sampling tables are *simplified* "single sampling" and "multiple sampling" tables of Military Standard 105-A, "Sampling Procedures and Tables for Inspection by Attributes," adapted for use by the General Services Administration. Inspection by Attributes is defined as "inspection wherein the unit of product is classified simply as defective or nondefective with respect to a given requirement or set of requirements."

Regional GSA Testing Laboratories

Responsibilities and Types of Testing. The primary responsibility of the regional testing laboratories of the General Services Administration is the (*a*) acceptance testing and (*b*) bid sample testing under the General Supply Fund (GSF) and Federal Supply Schedule (FSS) programs for items purchased in the largest volumes. Other types of laboratory work in which they may be engaged are: (*c*) qualification testing, (*d*) research and development testing, (*e*) certification testing, (*f*) reimbursable and (*g*) other approved testing.

The types of testing are as follows:

"(*a*) *Acceptance Testing*: To determine compliance with requirements of the contract, purchase order, and governing specifications before an order or shipment is accepted . . .

"(*b*) *Bid Sample Testing*: . . . To determine compliance with requirements of applicable specifications or purchase descriptions before making an award . . .

"(*c*) *Qualification Testing*: To determine compliance of an item or commodity with the specifications requirements of a specification prior to inclusion in a Qualified Products List. (See "Development and Use of Qualified Products List," by S. P. Kaidanovsky, pages 336-337, THE MAGAZINE OF STANDARDS, October 1954.)

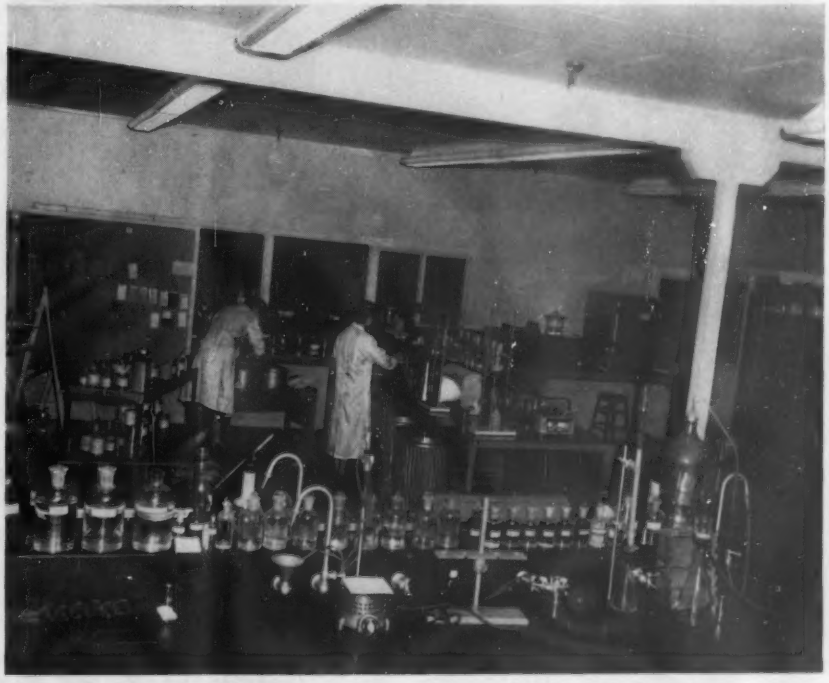
"(*d*) *Research and Development Testing*: To determine whether a new article or commodity which is not covered by an existing specification may be suitable for government use.

"(*e*) *Certification Testing*: To determine whether a certificate of acceptability from a Government testing laboratory should be issued, as provided in a Federal Specification."

When a regional testing laboratory cannot perform certain tests, the sample may be transmitted to another GSA laboratory, to another government laboratory, or to a commercial testing laboratory.

Review of Specification Test Methods. Laboratory test methods prescribed in the commodity specifications are reviewed and commented upon by qualified laboratory personnel with a view toward recommending any new methods found more effective for the particular item. Laboratory technicians are encouraged to recommend changes in specifications to the Director, Inspection Division.

A solvent extraction *at GSA's Region 9 (San Francisco) Laboratory*



General view *of the chemical laboratory of GSA's Region 9*

Responsibility for Acceptance or Rejection of a Shipment. It is the responsibility of a laboratory technician, with the approval of the laboratory Chief, to recommend the acceptance or rejection of a commodity tested. However, it is the inspector's responsibility to accept or reject a shipment.

Paint testing *at the General Service Administration's Washington Laboratory*

Major Laboratory Equipment. Lists of major laboratory equipment are prepared for each region by the Inspection Division, Central Office, to cover all specification tests for each commodity group. These include, among others, paints; paper products; chemical items, such as soaps, detergents, and waxes; foods; hand tools; and textiles.

Laboratory Specification Reference Sheets. As a guide in obtaining uniform laboratory operations, including interpretation of test results and standardized reports and records, Laboratory Specification Reference Sheets are used by the regional testing laboratories.

The Inspection Division, with the cooperation of regional laboratory staffs, prepares and keeps up to date a reference sheet for each Federal Specification under which tests are or will be conducted in the laboratories. Each Laboratory Specification Reference Sheet lists all the requirements for which tests will be made. However, when performing the tests, the detailed test requirements in the applicable Federal Specification are followed.

Inspection of Packaging, Packing, and Marking

It is the responsibility of the inspectors to assure compliance with packaging, packing, and marking requirements of contracts or purchase orders.

Figure 2. *Steel Stamp (diameter 3/8 in.)*

Figure 1. *Rubber Stamp (actual size) City name must be changed in each case*

The following terms have the meaning set forth below:

"(*a*) *Packaging.* The use of wrapping, cushioning materials, containers, and related techniques to protect items from deterioration, facilitate handling, and prevent loss or damage to the item packaged. As commonly used in Government specifications, this term refers to interior packages.

"(*b*) *Packing.* Packing is the preparation of an item for shipment or storage, including necessary blocking, bracing, cushioning, wrapping, weatherproofing, and placement in the exterior shipping container. As commonly used in government specifications, this term refers to the exterior or shipping containers.

"(*c*) *Marking.* Marking includes any written or printed symbol placed on a container used in packaging or packing to provide information about the contents of the container, handling (FRAGILE—THIS SIDE UP), preservation, warning, consigner, and consignee."

Stamping of Material Inspected

In order to prevent substitution of other material which has been inspected at origin, and to indicate to the receiving activity that material has been inspected for compliance with contract requirements, three types of stamps are used in stamping material.

Figure 3. *Brass stencil (entire stencil approx 3 x 5 in.; circle 2 in. diameter)*

1. *Rubber Stamp* (Figure 1) is used in stamping cartons or boxes. This stamp bears the name of the inspection region. It may be used with any of the various types of stamping devices; for example, the automatic inking type or the various types of roll mechanisms.

2. *Steel Die Stamp* (Figure 2) is used in stamping machinery or metallic goods which will not normally be packaged. The steel die stamp can also be used as an identification insignia and for stamping railroad car seals.

3. *Brass Stencil* (Figure 3) is used in stamping uneven rough surfaces, such as burlap, bales, or rough-finish crate or box lumber.

Coordination of Government Inspection Activities

The staff of the Inspection Division participates in meetings with Department of Defense inspectors in developing procedures and methods applicable to common-use items. The Inspection Division, GSA, also promotes the exchange of inspection and testing services of the General Services Administration, Food and Drug Administration, and the Department of Agriculture.

It is expected that more active coordination of the inspection and testing facilities of government agencies at the field level will be obtained. It is also believed that complete exchange of inspection and testing services could be achieved at the field level through standardization of documentation and contract management.

A refluxing problem *at GSA's Washington laboratory*

GAILLARD SEMINAR

The following organizations were represented for the first time at the private seminar on Industrial Standardization held by Dr John Gaillard in New York City, June 13 through 17, 1955:

Avro Aircraft Limited (Canada)
Columbia-Southern Chemical Corp
Diamond Alkali Co
Underwood Corp
Zenith Radio Corp

The other firms represented at the June seminar had sent delegates also to one or more previous sessions.

The next five-day Gaillard Seminar will be held from January 23 through 27, 1956, in the Engineering Societies Building, New York City. The major subjects to be discussed are the organization and procedure of standardization work in an individual company, and the principles and technique of formulating standard specifications.

Formerly a member of the ASA staff and a lecturer at Columbia University, Dr Gaillard is now a private management counsel specializing in advice on standardization problems.

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering please refer to the number following the title.

389 METROLOGY

Germany (DNA)

Conversion table of micro-inches in microns — DIN 4892, B1.3

532 MECHANICS OF FLUIDS

Germany (DNA)

Determination of viscosity — DIN 51550
Ubbelohde type viscometer — DIN 51562

535.2 RADIATION. PHOTOMETRY

Portugal (IGPAI)

Photometric units — P-77

536.5 TEMPERATURE MEASUREMENT

Germany (DNA)

Distillation type thermometer — DIN 12784, B1.1

542.1 CHEMICAL LABORATORY EQUIPMENT

Germany (DNA)

Capillary connecting tube with ground glass joint — DIN 12253

614.84 FIRE BRIGADE

Czechoslovakia (CSN)

3 sizes of suction hoses of fire fighting pumps — CSN 389404/6

621.13 RAILWAY LOCOMOTIVES

Germany (DNA)

Stud with both end Whitworth thread and square shank in the middle, ¼ in. to 1 in. diameter — DIN 30325, B1.2
Electric locomotive wheel setting for 900 mm track — DIN 34218
Parts of brake shoes — DIN 37081
Detail of feed water valve on tender — DIN 36501, B1.2

621.3 ELECTRICAL ENGINEERING

Czechoslovakia (CSN)

Round copper wire conductors used in power cables; sizes — CSN 347201
Power cables, plastic-sheathed — CSN 347619
Power cables, paper insulated, lead sheathed — CSN 347621
3 stds for telecommunication cords — CSN 347760/2
10 stds for different insulators for overhead power and communication lines — CSN 348004, -8014/6, -8101/7
High tension fuses — CSN 354720
Lineman belt — CSN 359715
6 stds for electric heating apparatus — CSN Series 3614 . . .
4 stds for multiple binding posts — CSN 304490/3
Insulation tapes, cotton and artificial silk — CSN 803671
Standard bulbs for incandescent lamps — CSN 703810

France (AFNOR)

Symbols for electrical wiring in dwellings — NF P 02-010

Germany (DNA)

Graphical symbols for switchgears — DIN 40700, B1.1
Oil gage for transformers, type B — DIN 42552, B1.2
Support insulator, group B, for inside installations — DIN 48101, B1.3
Single-pole HT fuses up to 30 kv — DIN 43624
Head lamp for battery-operated, railless locomotive — DIN 43542
Tail-light for battery-operated railless locomotive — DIN 43544
Steel and nickel-cadmium batteries — DIN 40754
Magnetic cores for small transformers — DIN 41304, B1.3
High-frequency cables, characteristic impedence of 240 ohms — DIN 47261

India (ISI)

Specification for two-and three-terminal ceiling roses — IS 371
Specification for table-type electric fans — IS 555

Netherlands (HCNN)

Designation of insulated conductors for heavy current — V 1276
Accessories for conductors used in installations for heavy current — V 2118
Cable accessories: connecting terminals — V 2130
Cable accessories: Mounting of low-voltage cable-joints with isolating compound — V 2135

United Kingdom (BSI)

Glossary of terms used in radiology — B.S. 2597:1955
Electric coffee percolators and brewers for domestic use — B.S. 2607:1955
Electrically heated blankets — B.S. 2612:1955

621.643 PIPES AND ACCESSORY PARTS

Czechoslovakia (CSN)

12 stds for metal flexible tubing, interlocking and seamless — CSN series 0283 . . .

Netherlands (HCNN)

Lead pipes for gas- and water supply — N 1254
Lead waste-pipes — V 1348
Tubes of copper alloy for heat exchangers — V 1478
Seamless copper tubes. Testing — V 2263

621.791 WELDING. SOLDERING, ETC

Czechoslovakia (CSN)

Soldering paste — CSN 670211

United Kingdom (BSI)

General requirements for the metal-arc welding of weldable structural steel tubes — B.S. 938:1955

621.88 MEANS OF ATTACHMENT

Czechoslovakia (CSN)

Cylindrical counterbore for hexagon headbolts — CSN 021020/1
Countersunk oval head wood screws — CSN 021815

Japan (JISC)

9 standards bound in one volume: bolts and nuts: — JIS B 1122*; 1151*/58

621.89 LUBRICATION

Czechoslovakia (CSN)

2 stds for testing lubricating oil — CSN 656228, -6318
Motor oil — CSN 656636
Cylinder oil — CSN 656655/6

Germany (DNA)

SAE viscosity values for crankcase oils — DIN 51511
SAE viscosity values for transmission and axle lubricants — DIN 51512

621.9 MACHINE TOOLS

Czechoslovakia (CSN)

25 stds for milling cutter arbor, holder, sockets, etc — CSN series 220400 . . . CSN series 241400 . . .
13 stds for tools used in lumbering — CSN series 225900 . . .

Germany (DNA)

Small drills — DIN 1899
High-speed steel twist drills, general — DIN 1414
Twist drills' parts, description of — DIN 1412

India (ISI)

Specification for smith bits — IS 552
Combined drills and countersinks (center drills) — IS 664

622 MINING

Czechoslovakia (CSN)

6 stds for mining borers with inserted hard metal tips — CSN series 2219 . . .

Germany (DNA)

Explosion-proof connections for mining tools — DIN 22416
Triangular-head screws, nuts and washers for explosion-proof connections — DIN 22423/5
7 stds for axle-wheel assembly for mining surface wagon of 900 mm gage — DIN 22601, B1.1 and 2, 22603, B1.2, 22605 B1.2, 22608/9, 22611 B1.4
6 stds for braking triangle of mining surface wagon and its parts — DIN 22616, B1.1-5, 22617.

624 CIVIL ENGINEERING

Czechoslovakia (CSN)

Admissible loads due to snow and wind — CSN 731312
4 stds for metal door frames — CSN 746501, -6511, -31, -41.

624.2 BRIDGE CONSTRUCTION

Germany (DNA)

Reinforced concrete bridges. Designing — DIN 1075

624.9 STRUCTURAL ENGINEERING

Czechoslovakia (CSN)

Steel framing for hydroelectric plants, designing — CSN 730911

625.2 RAILWAY ROLLING STOCK

Germany (DNA)

Main brake valve — DIN 39153
Operating brake valve — DIN 39168

625.7 ROAD CONSTRUCTION

Czechoslovakia (CSN)

10 stds for asphalt and asphalt-concrete surfacing of highways — CSN series 736141/50

629.11 LAND VEHICLES. TRANSPORT ENGINEERING

Germany (DNA)

Form of thread of tire valves	DIN 7756
Gage for tire rims	DIN 7840
Cooling system rubber hose	DIN 73411
Disc wheels	DIN 74361

629.118.3 BICYCLES

France (AFNOR)

Pedal assembly hub — NF R 371-05

629.12 SHIPS AND SHIPBUILDING

Germany (DNA)

6 stds for different control handwheels and levers — DIN 87305 Bl.1 and 2, 87308, 87309 Bl.1-3.

Two kinds of soldering and welding pipe taps — DIN 86103

Extension bolt — DIN 86104

6 stds for different pipe unions — DIN 86140 Bl.1-3, 86142/3, 86146

Steel screen for suction pipe — DIN 87160 Bl.1 and 2.

Netherlands (HCNN)

Ship screw propellers: allowable deviations from measurements	N 974
urements	N 974
Shipbuilding details: Vertical bollards	N524

629.13 AERONAUTICS. AIRCRAFT ENGINEERING

Czechoslovakia (CSN)

Airplane fabrics	CSN 804596
Parachute fabrics	CSN 804597

Netherlands (HCNN)

100° Countersunk rivet (Aluminum Alloy)	V 1892
Mushroom head rivet (Aluminum Alloy)	V 1893

632 PROTECTION OF PLANTS. PHYTOPATHOLOGY

France (AFNOR)

Trichloroethylene	NF U 43-018
Hexachlorocyclohexane	NF U 43-210/1
Distillation of mineral oil for insecticides	NF U 43-215/6
Granulometric method for micronized sulfur	NF U 43-217

634 FRUIT CULTIVATION

France (AFNOR)

8 stds for different table fruits — NF V 20-001/2, V 21-003/4, V 21-501/4

635 HORTICULTURE

Czechoslovakia (CSN)

31 stds for various natural and cultivated agricultural products — CSN series 46 . . .

France (AFNOR)

7 stds for different table vegetables — NF V 22-001, -501, V 25-003, -501/4

645 FURNITURE

Netherlands (HCNN)

9 stds for office equipment: Desks, letter-baskets, racks, archives - boxes, filing - cabinets, book-cases, tables, etc	V 2185/93
10 stds for furniture for technical schools: work-benches, drawing tables, etc	V 2233/7, V 3075/9.

664 PREPARATION AND PRESERVATION OF SOLID FOODSTUFFS

Czechoslovakia (CSN)

36 stds for different processed cereals — CSN series 560000 . . .

665 OILS. FATS. WAXES

Czechoslovakia (CSN)

Gasoline	CSN 656505
Paraffins	CSN 657101
Ceresins	CSN 657111

India (ISI)

Specification for linseed oil, pharmaceutical — IS 558

667.6/.8 PAINTS. VARNISHES

France (AFNOR)

Sieving pigments	NF T 30-024
Comparison of pigment colors	NF T 30-025

India (ISI)

6 stds for varnishes and enamels, brushing and spraying types — IS 520/5

Netherlands (HCNN)

Solvents & thinners for the manufacturing of paints & varnishes. Petroleum products — N 601

Portugal (IGPAI)

Classification of paints and varnishes	NP -42
White lead	NP-43

668.1 SOAP INDUSTRY

Czechoslovakia (CSN)

4 stds for different grades of soap — CSN 681118, -1121, -26, -38.

668.736 TAR DISTILLATION INTERMEDIATE OIL. CREOSOTE

United Kingdom (BSI)

Cresylic acid of specified meta-cresol content — B.S. 521:1955

668.4 GUMS AND RESINS

Portugal (IGPAI)

4 stds for turpentine sampling and testing — P-72, -73, -75, -76.

669 METALLURGY

Czechoslovakia (CSN)

47 stds for different grades of alloy steels	CSN series 422 . . .
List of steels for domestic market: unified conventional symbols	CSN 420075
11 stds for copper and copper alloy rods, hot rolled and cold drawn	CSN series 428 . . .
7 stds for Babbit metal	CSN 421380, -3719/21, -3750/1, -8110.

France (AFNOR)

Chemical analysis of manganese ores	NF A 06-107
Galvanized corrugated sheet metal	NF A 46-320
Galvanized flat sheet metal, under 2 mm thickness	NF A 46-321
Hot rolled sheet metal with large trapezoidal corrugations	NF A 46-322

Germany (DNA)

Determination of corrosion effect from soil electric currents on metals	DIN 50910
Steel for springs, general	DIN 17220
Hot rolled steel for springs	DIN 17221
Cold rolled steel for springs	DIN 17222
Cold drawn steel for springs	DIN 17223
Stainless steel for springs	DIN 17224
Heat resisting steel for springs	DIN 17225

India (ISI)

Aluminum and aluminum alloy ingots and castings for general engineering purposes	IS 617
Black plate for tinning, and tin-plate	IS 597

672 ARTICLES OF IRON AND STEEL

Germany (DNA)

Round link steel chains for endless conveyor	DIN 762
Round link steel chain for bucket conveyors	DIN 764

672.46 CANS FOR PRESERVED FOOD

Netherlands (HCNN)

2 stds for round cans for condensed and powdered milk packing — V 2238/9

674 WOOD INDUSTRY

India (ISI)

Code of practice for preservation of timber — IS 401

677 TEXTILE INDUSTRY

France (AFNOR)

Basic measurements of human body	NF G 03-001
Different forms of stitches	NF G 05-002

India (ISI)

Specification for solid flange bobbins for jute roving frames	IS 700
Spool centers for jute spool winding machines	IS 699
Specification for picking arms (or sticks) for jute looms	IS 698
13 stds for various types of woolen fabrics	IS 668/680
Specification for woolen druggets for export	IS 697
Methods of determining the desizing efficiency and the relative efficiency of amylolytic enzymes	IS 647

Netherlands (HCNN)

10 stds for color fastness tests of textiles:	
II Standard gray scale for the evaluation of change in color	V 2201
III Standard grey scale for evaluating staining	V 2202
IV Fastness to acid	V 2203
V Fastness to alcale	V 2204
VI Fastness to Bleaching. Hypochlorite bleaching	V 2205
VII Fastness to Bleaching. Peroxide bleaching	V 2206
VIII Fastness to Carbonizing. Aluminum chloride	V 2207
IX Fastness to Carbonizing. Sulphuric acid	V 2208
X Fastness to Chlorination. Acid	V 2209
I General Directives	V 3200

United Kingdom (BSI)

Drop wires for warp stop motions	B.S. 2609:1955
Fluidity of cotton, rayons & cellulose acetate	B.S. 2610:1955

677.53 METAL TISSUES

Czechoslovakia (CSN)

19 stds for metal screens and nets of different size — CSN series 1531 . . .

687.9 BRUSH MANUFACTURE

India (ISI)

3 stds for various types of brushes for paints and varnishes — IS 384, 486, 487

691.1 BUILDING MATERIAL

India (ISI)

Specification for fireclay mortar for laying fireclay refractory bricks — IS 195

77 PHOTOGRAPHY

Czechoslovakia (CSN)

6 stds for photographic film reels 60 mm and 40 mm wide	CSN 196 . . .
Cut films, dimensions	CSN 666431
Photographic plates, sizes	CSN 666411

WHAT'S NEW ON AMERICAN STANDARD PROJECTS

CHARLES S. HAINES

OTTO HOLMSKOG

Safety for Building Construction, A10—

Sponsors: American Institute of Architects; National Safety Council

Charles S. Haines is the newly elected chairman of Sectional Committee A10 on Safety for Building Construction. Otto Holmskog, Employers Mutual Liability Insurance Company of Wisconsin, is the new secretary.

Earlier this year Mr Haines' abilities were recognized when he was appointed a Junior Partner in the well-known architectural firm of Voorhees Walker Smith & Smith, New York.

Mr Haines has been with the firm for the past 22 years, with only a pause here and there to attend Columbia University and obtain a degree of Bachelor of Architecture. He had already been graduated from the University of Kansas' Engineering School with a Bachelor of Science degree in Architectural Engineering. He was the University's Honor Man in 1929.

Now he is chairman of the Committee on Nuclear Facilities of the American Institute of Architects, as well as a member of the executive committee, Construction Section, of the National Safety Council. He is also active in affairs of both the American Society of Mechanical Engineers and the New York Building Congress.

During his years with Voorhees Walker Smith & Smith, Mr Haines has been project manager of many important projects, particularly in the field of research laboratory design and supervision. These projects include the Bell Telephone Laboratories, Murray Hill, N. J.; Westinghouse Laboratories; Esso Research Center; the super-secret Manhattan Project; and many others.

Mr. Holmskog is also well acquainted with safety problems in construction. He has served as the national chairman of the National Safety Council's Construction Section as well as secretary of the Associated General Contractors-Casualty Insurance Company Liaison Committee. He is author of a number of articles for the National Safety Council's magazine and of eleven booklets on various types of construction. Educated as an architectural engineer, his experience includes service with a company of architects in Wisconsin and with a firm of general contractors in New York.

Electrical Measuring Instruments, C39—

Sponsor: Electrical Standards Board

A subgroup expects that in the early Fall it will complete a proposed American Standard C39.4 on automatic null-balancing electrical measuring instruments. These instruments may be suitable for positioning various end devices, such as indicating, recording, controlling, repeating devices, etc, but the proposed standard considers only the indicating and recording end devices. Tabulated detailed requirements similar to those contained in American Standard C39.1-1953 will be included, as well as standard definitions, general requirements, test conditions, and test procedures.

The subgroup in charge of preparing Proposed American Standard C39.4 is scheduling meetings in September and October at which final decisions on the proposed standard will be made.

Electric Welding Apparatus, C52—

Plans are under way to set up two new projects to take the place of Project C52. If the plans are authorized by the Electrical Standards Board, a new project on Arc Welding Machines, C87, and one on Resistance Welding Machines, C88, will be organized. The National Electrical Manufacturers Association has offered to sponsor C88.

The two new projects will have the same scope of work in their individual fields: "The formulation of standards for arc (or resistance) welding machines, including definitions of terms, classification, rating, heating, efficiency, testing methods, dielectric test standard values of current and voltage, and data."

Committee C52, which will be disbanded, has three American War Standards to its credit: Straight and Offset Resistance-Welding Electrodes and Electrode Holders, C52.3-1954; Controls for Resistance-Welding Machines, C52.4-1945; and Specifications for Resistance-Welding Machines, C52.5-1945. This project had been sponsored by the American Welding Society; however, the Society asked to be relieved of sponsorship, and recommended the new setup.

Electric Lamps, C78—

Sponsor: Electrical Standards Committee.

A new rapid start fluorescent lamp is the subject of a proposed American Standard that defines its dimensional and electrical characteristics. Purpose of the proposed

standard is to assure lamp interchangeability. It is expected that the new lamp will come into wide use, and preparation of this proposed standard for its dimensional and electrical characteristics is in line with the policy of Sectional Committee C78 to peg its standardization activities to developments in the field.

The Proposed American Standard Dimensional and Electrical Characteristics of 40-Watt T-12 Rapid Start Fluorescent Lamp, C78.700, has been published for a period of trial and criticism. Copies are available from ASA at 25 cents. The committee will welcome comments.

Shockproof Cable Terminals and Receptacles, C86—

The General Services Administration, Federal Supply Service, and the National Electrical Manufactures Association are sponsors for this new project, which has the following scope:

Standards for dimensional interchangeability, rating, and performance requirements of shockproof high voltage cable terminals and receptacles for use on x-ray equipment.

One of the first questions to come before the committee when it is organized will be the possibility of establishing a specific voltage rating for a proposed American Standard based on Federal Standard No. 72, Shockproof Cable Terminal and Receptacle for Use on X-ray Equipment. The committee will also consider the development of standards governing the acceptance testing of shock-proof cable terminals and receptacles.

Acoustics—

Reorganization is now going on so that all the work on acoustics under the procedure of the American Standards Association will head up in a newly created Acoustical Standards Board. Formerly, acoustics came under the jurisdiction of the Electrical Standards Board.

Organizations specifically interested in acoustics are being invited to name representatives. They will have responsibility for the work of Sectional Committee Z24 on Acoustics, Vibration, and Mechanical Shock as well as Sectional Committee Z57 on Sound Recording.

One of the important questions that will come before the Board for action will be reorganization of Committee Z24. This committee now has more than 30 subcommittees working in such diverse fields as bio-acoustics, psycho-acoustics, noise control, architectural acoustics, instrumentation, hearing aids, terminology, uitrasonic diathermy, bells and electronic carillons, shock and vibration testing machines, and others. The Board will be asked to decide whether it might be more effective to organize many of these subcommittees into independent sectional committees.

The Acoustical Standards Board will also offer a more effective means for coordinating the viewpoint of USA groups on international work on acoustics.

The organizations invited to appoint representatives are: Acoustical Materials Association; Acoustical Society of America; American Academy of Ophthalmology and Otolaryngology; American Institute of Electrical Engineers; American Institute of Physics; American Medical Association; American Society for Testing Materials; Audio Engineering Society; U.S. Department of Defense; Institute of Radio Engineers; National Bureau of Standards; National Electrical Manufacturers Association; Radio-Electronics - Television Manufacturers Association: Society of Motion Picture and Television Engineers.

AMERICAN STANDARDS

Status as of June 28, 1955

Legend

Standards Council—Approval of Standards Council is final approval as American Standard; usually requires 4 weeks.

Board of Review—Acts for Standards Council and gives final approval as American Standards; action usually requires 2 weeks.

Standards Boards—Approve standards to send to Standards Council or Board of Review for final action; approval by standards boards usually takes 4 weeks.

Building

In Standards Board—

Building Code Requirements for Minimum Design Loads in Buildings and Other Structures, A58.1 (Revision of A58.1-1945)
Sponsor: National Bureau of Standards

Standard Submitted—

Standard Types of Building Construction, A110.1; NFPA 220
Sponsor: National Fire Protection Association

Electrical

In Board of Review—

Computing Food-storage Volume and Shelf Area of Automatic Household Refrigerators, Method of, B38.1; NEMA HR1 (Revision of B38.1-1944)
Sponsors: American Society of Refrigerating Engineers; U.S. Department of Agriculture, Home Economics Research Branch

In Standards Board—

Terms for Audio Techniques, Definitions of, C16.24; 54 IRE 3.S1 Definitions of Terms for Radio Aids to Navigation, C16.26
Sponsor: Institute of Radio Engineers

Electrical Indicating Instruments, C39.1 (Revision of C39.1-1951)
Sponsor: Electrical Standards Board

Testing Molded Materials Used for Electrical Insulation, Methods of, ASTM D48-54T; ASA C59.1 (Revision of ASTM D48-52T; ASA C59.1-1954)

Testing Electrical Insulating Oils, Method of, ASTM D117-54T; ASA C59.2 (Revision of ASTM D117-43; ASA C59.2-1944)

Test for Insulation Resistance of Electrical Insulating Materials, Methods of, ASTM D257-54T; ASA C59.3 (Revision of ASTM D257-52T; ASA C59.3-1954)

Testing for Impact Resistance of Plastics and Electrical Insulating Materials, Methods of, ASTM D256-54T; C59.11 (Revision of ASTM D256-47T; ASA C59.11-1948, R. 1954)

Sponsor: American Society for Testing Materials

Definitions of Terms of Electron Tubes, C60.9

Definitions of Terms of Magnetrons, C60.10

Definitions of Terms of Gas-Filled Radiation Counter Tubes, C60.12

Sponsor: Joint Electron Tube Engineering Council

Standard Submitted—

Electric Railway Control Apparatus, C48 (Revision of C48-1931)

Sponsor: American Institute of Electrical Engineers

Graphic

In Board of Review—

Graphical Symbols for Plumbing, Y32.4 (Revision of Z32.2.2-1949)

Sponsors: American Institute of Electrical Engineers; American Society of Mechanical Engineers

Materials and Testing

In Standards Board—

Nickel Seamless Pipe and Tubing, Specifications for, ASTM B161-49T; ASA H34.1

Nickel-Copper Alloy Seamless Pipe and Tubing, Specifications for, ASTM B165-49T; ASA H34.2

Nickel-Chromium-Iron Alloy Seamless Pipe and Tubing, ASTM B167-49T; ASA H34.3

Hardness Conversion Table for Cartridge Brass (Relationship Between Diamond Pyramid Hardness, Rockwell Hardness, and Brinell Hardness), ASTM E33-42; ASA Z76.1

Hardness Conversion Table for Steel (Relationship Between Diamond Pyramid Hardness, Rockwell Hardness, and Brinell Hardness), ASTM E48-43T; ASA Z76.2

Hardness Conversion Table for Nickel and High-Nickel Alloys (Relationship Between Diamond Pyramid Hardness, Brinell Hardness, and Rockwell Hardness), ASTM E93-52; ASA Z76.3

Analysis of Natural Gases by the Volumetric-Chemical Method, Method for, ASTM D1136-53; ASA Z77.1

Analysis of Natural Gases and Related Types of Gaseous Mixtures by the Mass Spectrometer, Method for, ASTM D1137-53; ASA Z77.2

Test for Water Vapor Content of Gaseous Fuels by Measurement of Dew-Point Temperature, Method of, ASTM D1142-53; ASA Z77.3

Sampling Natural Gas, Method of, ASTM D1145-53; ASA Z77.4

Sponsor: American Society for Testing Materials

Mechanical

American Standard Approved—

System for Straight Bevel Gears, B6.13-1955

Sponsors: American Gear Manufacturers Association; American Society of Mechanical Engineers

In Standards Board—

Code for Pressure Piping, B31.1 (Revision of B31.1-1951)

Sponsor: American Society of Mechanical Engineers

Scales for Use With Decimal-Inch Dimensioning, Z75.1

Project Initiated—

Plastic Pipe, B72
Requested by: Chemical Industry Advisory Board; American Society of Mechanical Engineers

Reaffirmation Being Considered—

Reamers, B5.14 (Reaffirmation of B5.14-1949)
Requested by: American Society of Mechanical Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers

Withdrawal Being Considered—

Rotary Cone Valves, B61
Requested by: American Society of Mechanical Engineers

Medical

In Board of Review—

Dimensions for Glass and Metal Luer Tapers for Medical Applications, Z70.1

Sponsor: Miscellaneous Standards Board

Mining

Standard Submitted—

Recommended Practice for Drainage of Coal Mines, M6 (Revision of M6-1931)

Sponsor: American Mining Congress

Office Equipment

In Standards Board—

Basic Sheet Sizes and Standard Stock Sizes for Bond Papers and Index Bristols, X2.2.1

Sponsor: National Office Management Association

Petroleum Products and Lubricants

American Standard Published—

Test for Distillation of Crude Petroleum, Method of, ASTM D285-54T; ASA Z11.32-1955 (Revision of ASTM D285-52; ASA Z11.32-1952) $0.30

Sponsor: American Society for Testing Materials

Photography

American Standards Published—

Distance Scales for Focusing Camera Lenses, PH3.20-1955 (Revision of Z38.4.3-1947 and Z38.4.13-1948) $0.25

Distance scale markings are indicated in terms of both feet and meters for focusing camera lenses. The index mark for indicating the plane on which the distance scale is based is also given.

Dimensions for Medical X-ray Film Cassettes (Inch and Centimeter Sizes), PH3.21-1955 $0.25

Dimensions are given for all types of medical x-ray film cassettes designed to hold luminescent chemical x-ray intensifying screens and medical x-ray sheet film. The standard also covers the size and location of lead blockers installed in cassettes in connection with the use of film identification printers.

Sponsor: Photographic Standards Board

American Standards Approved—

16mm Film Perforated One Edge, Usage in Camera, PH22.15-1955 (Revision of Z22.15-1946)

16mm Film Perforated One Edge, Usage in Projector, PH22.16-1955 (Revision of Z22.16-1947)

35mm 3-Track Magnetic Flutter Test Film, PH22.98-1955

Sponsor: Society of Motion Picture and Television Engineers

In Standards Board—

Dimensions for 70mm Perforated Film for Cameras Other Than Motion Picture Cameras, PH1.20

Focal Length of Lenses: Markings, PH3.13 (Revision of Z38.4.4-1942)

Sponsor: Photographic Standards Board

Reaffirmation Being Considered—

Sound Focusing Film for 35mm Motion Picture Sound Reproducers (Service Type), PH22.61 (Reaffirmation of Z22.61-1949)

Buzz-Track Test Film for 35mm Motion Picture Sound Reproducers, PH22.68 (Reaffirmation of Z22.68-1949)
Requested by: Society of Motion Picture and Television Engineers

Safety

In Board of Review—

Prevention of Dust Explosions in Flour and Feed Mills, Code for, Z12.3 (Revision of Z12.3-1953)

Prevention of Dust Explosions in Terminal Grain Elevators, Code for, Z12.4 (Revision of Z12.4-1953)

Prevention of Dust Ignitions in Country Grain Elevators, Code for, Z12.13 (Revision of Z12.13-1953)

Sponsor: National Fire Protection Association

New Projects Requested—

Auto Seat Safety Belts
Requested by: Association of Casualty and Surety Companies, Accident Prevention Department; Industrial Safety Equipment Association

Safety Code for Lawn Mowers
Requested by: Lawn Mower Institute

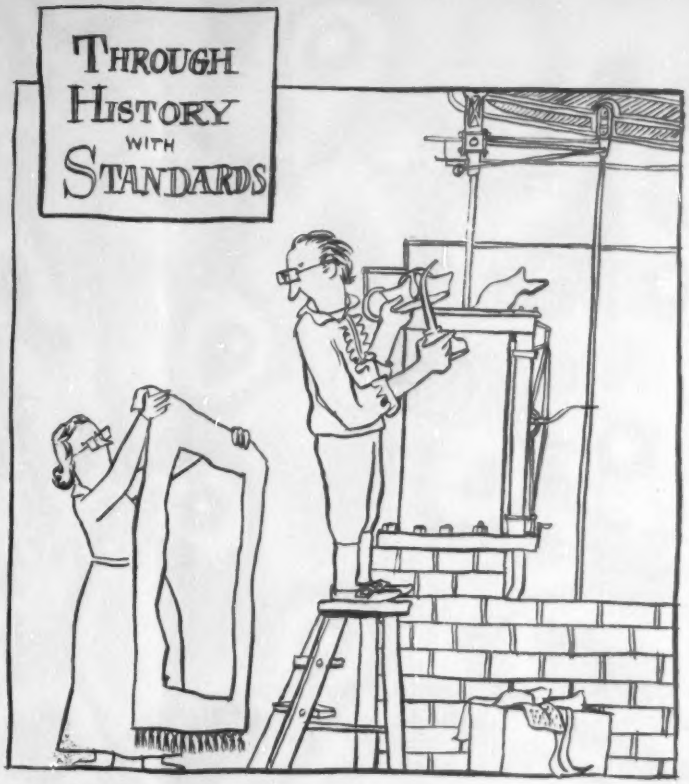
Safety Codes for Nuclear Reactors, Accelerators and Other Related Subjects
Requested by: American Society of Mechanical Engineers

Withdrawal of Project Being Considered—

Metal Cleaning Sanitation, Z46
Requested by: Safety Standards Board

Continued from page 238

radiation to managerial problems such as the allocation of government purchasing contracts. The Bureau is also engaged in the design and development of machines and components that go far beyond the capabilities of most presently available equipment. This work is directed toward the specialized needs of both military and regular government operations.



James Watt (1736-1819) struggled for ten years to master a basic problem in building his first condensing steam engine. He had to find out how to keep his steam from escaping from the cylinder and losing most of its force.

Straight and smooth pistons could be turned on a lathe, but the interior of the cylinder could not be accurately bored or machined after being cast. To make a piston tight in a misshapen cylinder, Watt "wrapped it around with cork, oiled rags, tow, old hats, paper, and other things, but still there were open spaces left, sufficient to let the air in and the steam out." On one cylinder on which he was working, having a diameter of 18 inches, "at the worst place the long diameter exceeded the short by three-eighths of an inch."

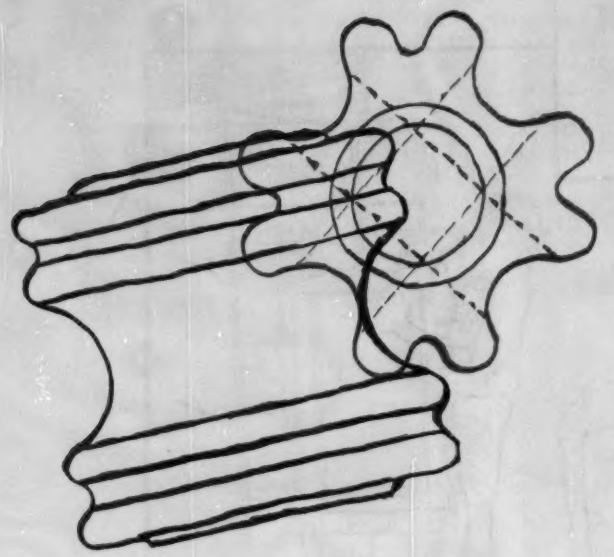
Watt's problem was the fundamental one of designing a machine on his drawing board that he could build in his shop. The problem is still very much with us.

Fits between cylindrical parts govern the proper assembly and performance of countless mechanisms today. Since a certain degree of inaccuracy cannot be avoided in manufacture and "exact" dimensions cannot be established, a practical system for making interchangeable parts has grown up. It is based on the adoption of manufacturing limits that define a tolerance zone for each exacting dimension.

Various types of fits are thus divided into classes of general character, with each class covered by definite limits or tolerances. This makes general interchangeability possible between parts of the same nominal size and class of fit. It is on this basic system of standardization that mass production methods in the mechanical and related industries are based.

Over the years many individual systems of fits, tolerances and allowances have been developed by various companies, industries and groups of industries for their individual purposes. Now American industry is struggling with the immensely difficult and complex problem of developing a standardized system of limits and fits that can be accepted by all industry and applied on a national basis. Focal point of the effort is ASA Committee B4, Allowances and Tolerances for Cylindrical Parts and Limit Gages, sponsored by the American Society of Mechanical Engineers.

In addition, various meeting have been held among the ABC countries (America, Britain and Canada) in an effort to draw up standard tables of limits and fits for use by the three countries. The American delegation in this work is made up of members of the B4 committee. ASA published a draft proposal for an ABC system of limits and fits for the information of American industry in 1953. Now, Committee B4 has near completion a proposed new American Standard on limits and fits based on the ABC agreements.



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Wet Process

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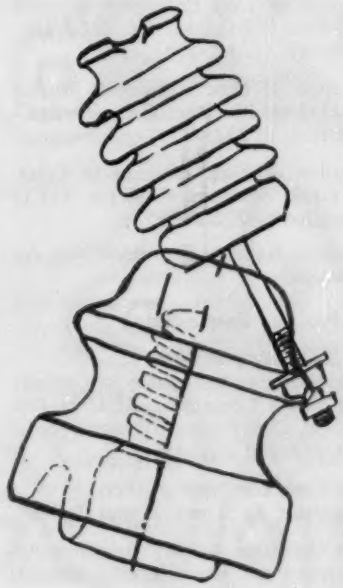


What These Standards Do—

Cover standard insulators of all types needed for transmission and distribution of electric power from low secondary voltages through the complete voltage range.* (Number of insulators in each type is cut to a minimum to give the fewest designs that will provide full insulation coverage and at the same time gain benefits of standardization.)

** Switch and bus insulators not included.*

Outline requirements for material; marking; packing; sampling; inspection, and tests; and quality control tests.

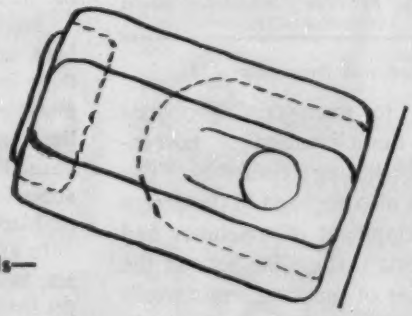
Specify tests required for each type of insulator, with reference to standard methods of carrying out tests required.

Include data sheets with drawings and detailed ratings covering dimensions, mechanical values, electrical values, radio influence voltage data. Also refer to applicable section or paragraph in American Standard Insulator Tests, C28.1-1944.

Insulator types for which standards are available—

Spool Type, C29.3-1955 (EEI No. TDJ-53; NEMA No. 141-1952)
Strain Type, C29.4-1955 (EEI No. TDJ-45; NEMA No. 142-1952)
Low- and Medium-Voltage Pin Type, C29.5-1955 (EEI No. TDJ-55; NEMA No. 143-1952,
High-Voltage Pin Type, C29.6-1955 (EEI No. TDJ-56; NEMA No. 144-1952)
High-Voltage Line-Post Type, C29.7-1955; (EEI No. TDJ-57; NEMA No. 145-1952)

Each 50 cents per copy *Quantity prices on request*



Soon to be published—

Suspension Type, C29.2 (EEI No. TDJ-52; NEMA No. 140-1952)

These standards are part of a series developed by the Joint Committee on Insulator Standards of the Edison Electric Institute and the National Electrical Manufacturers Association, and approved by the American Standards Association.

Other American Standards on insulators for use with these standards—

Insulator Tests, C29.1-1944 (AIEE 41-1944) 80 cents
Measurement of Test Voltage in Dielectric Tests, C68.1-1953 (AIEE 4-1953) 80 cents
Wet Tests, C77.1-1943, R 1953 (AIEE 29-1941) 40 cents
Preferred Voltage Ratings for A-C Systems and Equipment, C84.1-1954 (EEI R-6; NEMA 117) 70 cents

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